# WIRE & WIRE PRODUCTS

OFFICIAL PUBLICATION OF THE WIRE ASSOCIATION

VAUGHN MOTOBLOCS

WIRE manufacturers, like all other manufacturers, are today making a determined effort to develop new markets and new uses for their products, all of which entails the drawing of many new sizes and types of wire.

In Motobloc-equipped plants,--no additional machine investment is necessary to cope with this situation, Motoblocs can handle numerous sizes and types without change, while their speed flexibility enables them to produce efficiently over a wide range. Motoblocs are a safe and profitable investment any time.

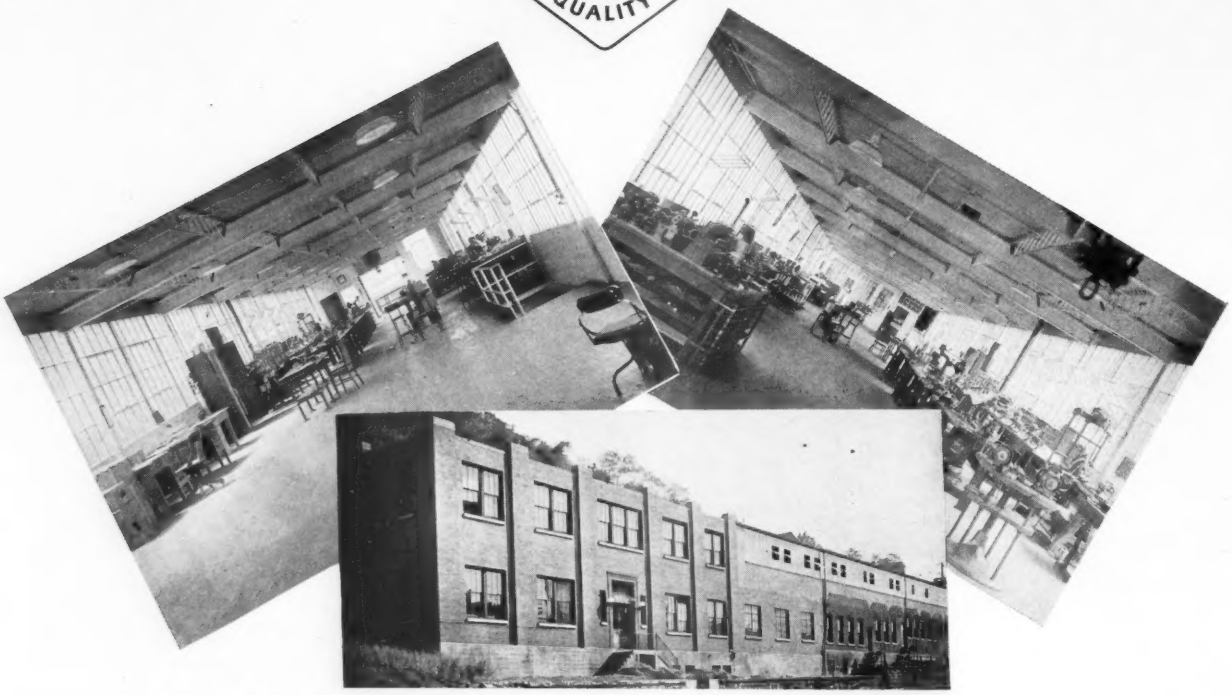
The Vaughn Machinery Company . . Cuyahoga Falls, Ohio

Manufacturers of Vaughn Motoblocs, Copper Wire Drawing Machines and other wire mill equipment for Pointing; Patenting, Galvanizing, Tinning, etc.



November 1932

FIRTH-STERLING
FIRTHALOY
QUALITY



# "NEW FIRTHALOY DIE PLANT"

The Firth-Sterling Steel Company has just completed a plant for the manufacture of FIRTHALOY CEMENTED CARBIDE DRAWING AND EXTRUSION DIES. The new shop is equipped with the latest types of precision instruments, assuring an accurate check of contours and permitting perfect duplication of design at any time.

The building of this Firthaloy Die Plant at this time has been necessary because of the rapidly growing acceptance of Firthaloy Dies. It enables us to give unusually prompt and thorough service on orders of any size.

MAY WE SEND YOU A COPY OF THE NEW FIRTHALOY BULLETIN No. 3?

## FIRTH-STERLING STEEL COMPANY

WORKS: McKEESPORT, PA.
NEW YORK CHICAGO
HARTFORD CLEVELAND
DETROIT LOS ANGELES
PHILADELPHIA
GLOBE WIRE DIVISION
SHARPSBURG, PA.

# Order Your Copy Now!

**Limited Edition of the**

## Wire Association 1932 Meeting Discussions

## PRICE $2.50

***These Discussions Will Not Be Published in WIRE & WIRE PRODUCTS or Elsewhere***

**The Discussions Cover the Following Subjects of Interest to Rod and Wire Mill Men**

### "Wire Drawing As A Handling Problem"

**Dies—Spooling—Welding—Brazing—Lime**

✦ ✦ ✦

### "Copper Rod Rolling, Wire Drawing and Annealing"

**Annealing—Casting—Dies—Drawing Speeds—En ameling—Furnace Types — Lubricants — Rolling —Spooling—Tinning—Vacuum Dryers.**

✦ ✦ ✦

### "Wire Mill Cost Records"
### "Plant Efficiency"

**Foremen's Meetings—Basic Steel Weaving Wire-Annealing— Bakers—Cleaning—Pickling—Inhibitors**

✦ ✦ ✦

### "Patenting of Rods and Wire"

**Dies—Die Records—Lead Quenching—Salt Quen ching—Temperature Control—Water Cooling of Dies.**

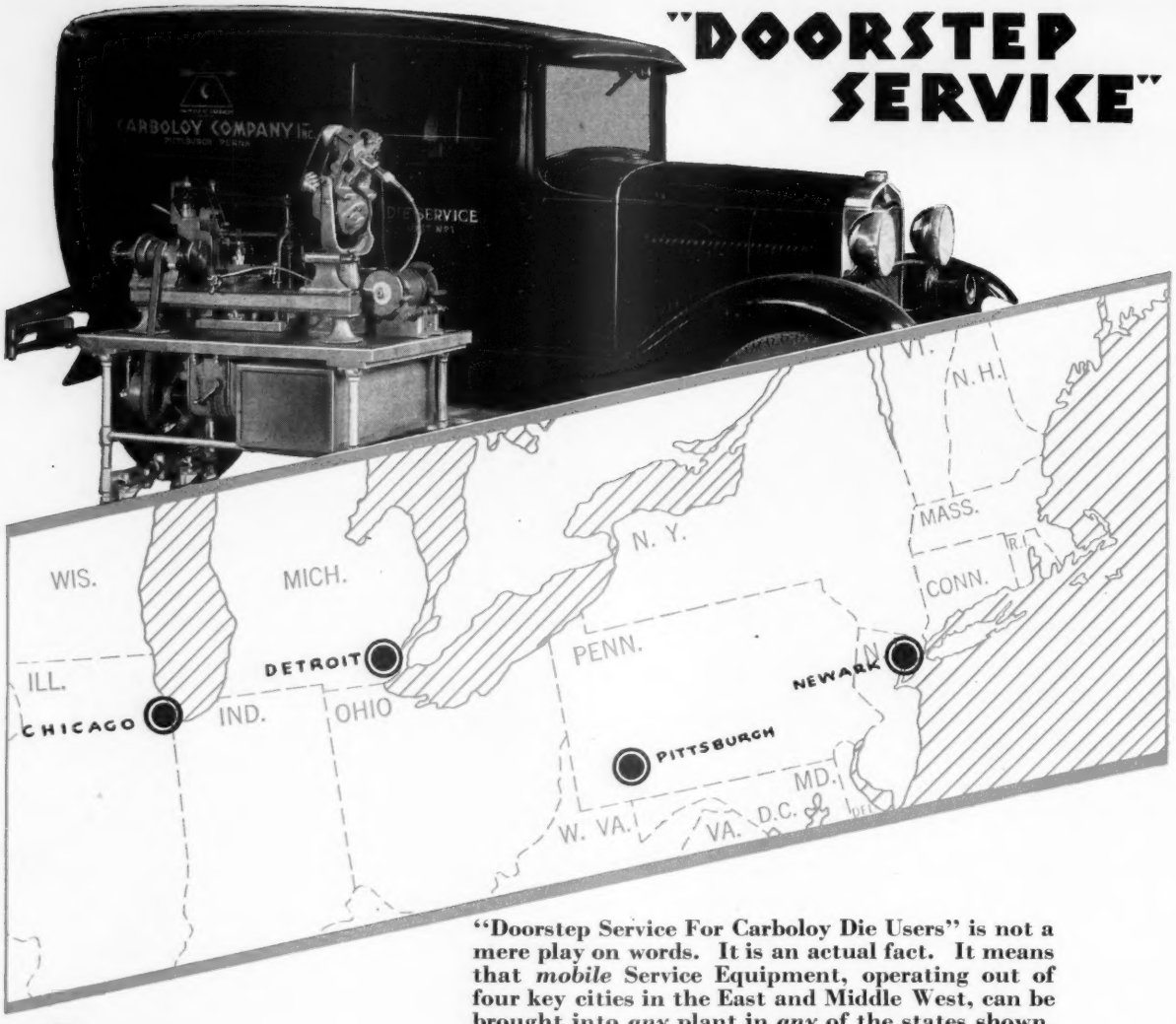
✦ ✦ ✦

### "The Production of Stainless Hot Rod"

**Slitting—Pitting—Coiling—Controls—Cleaning and Pickling— Inhibitors—Acids—Sulling.**

*To Order* . . Mail in Coupon on Page 403

# "DOORSTEP SERVICE"




Carboloy *Mobile* Service Units are located in 4 key cities and cover states shown above. The special unit illustrated operates in the Pittsburgh District. It will be on display in Booth F-25, Nat'l Metal Show, Buffalo, Oct. 3-7, 1932.

**"Doorstep Service For Carboloy Die Users" is not a mere play on words. It is an actual fact. It means that *mobile* Service Equipment, operating out of four key cities in the East and Middle West, can be brought into *any* plant in *any* of the states shown, for *any* service work required (except sectional and shaped die work).**

**Whether it be to recut a single die or to manufacture a hundred dies from the moulded nib in casing to the finished die, these mobile service units are adequate to do the job. They are brought into your plant by experienced operators,—trained die men with a broad background of experience on hundreds of varied jobs. These operators *fit the die to the job and see that it works before they leave!***

***That* is "Doorstep Service" for Carboloy Die Users! A request to any of the offices listed below will bring this *mobile* service and manufacturing equipment to *your* "doorstep" when required.**

CARBOLOY COMPANY, INC.
2481 East Grand Blvd., Detroit, Mich.

CHICAGO
565 W. Washington St.

CLEVELAND
4503 Hough Avenue

NEWARK
144 Orange Street

PHILADELPHIA
4301 No. Broad Street

PITTSBURGH
704 Second Avenue

The Mark of CARBOLOY
REG. U.S. PAT. OFF.

# CARBOLOY

REG. U. S. PAT. OFFICE

**CEMENTED CARBIDE DRAWING AND EXTRUSION DIES**

# GRIT-FREE LIME FOR WIRE DRAWING

● An outstanding feature of the discussions of Lime at the Wire Association Convention held at Buffalo, N. Y., was the necessity for a "Grit-Free" Lime. This was stressed by superintendents of the largest wire drawing plants, many of whom have used and now specify . . .

# BELL-MINE ROTARY KILN PULVERIZED

MANUFACTURED BY THE AMERICAN LIME & STONE COMPANY, WITH MAIN OFFICE AND PLANT AT BELLEFONTE, PA. AND SALES OFFICES AT PITTSBURGH, NEW YORK CITY, PHILADELPHIA AND WILMINGTON.

# OUR EXTENSIVE LINE

OF

## Wire Drawing, Wire Working, Wire Spring Machinery and Wire Mill Equipment

✦ ✦ ✦

**Standard and Special Machinery of all kinds, for producing:**

**Wire Spirals, Flattened Wire, Formed Wire, Straightened Music Wire, Lock Washers**

✦ ✦ ✦

**Flexible Shafting and Flexible Metallic Tubing**
**Hollow Steel, Conduit, Armored Wires,**
**Armored "BX", Parkway Cable and Hose**
**Wire Nails, Staples, Double Point Tacks**

✦ ✦ ✦

**Wire Mill Equipment of the latest types, including:**

**Continuous Wire Drawing Equipment for both Wet and Dry Drawing, high and low carbon wire, from No. 5 rods to No. 36**

✦ ✦ ✦

**Wire Pointers, Wire Pullers—Tinning and Galvanizing Frames**
**Patenting Furnaces and Take-Ups**
**Multi-Head Wire Straightening and Cutting Machines**

✦ ✦ ✦

**Wire Twisting and Stranding**
**Wire Spooling Devices of many kinds**

✦ ✦ ✦

**Spring-Making Machinery of Every Description**

**Spring Coiling, Spring Winding, Spring Setting, Spring Grinding, Spring Hooking and Spring Knotting Machinery**

✦ ✦ ✦

**Wire Reels of All Kinds** **Nail Die Grinding Machines**

**Our many machines have been thoroughly proven over a period of years. We solve your special problems.**

---

# SLEEPER & HARTLEY, INC.

WORCESTER, MASS., U. S. A.

**DESIGNERS & BUILDERS OF HIGH PRODUCTION MACHINERY**

# WIRE & WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip. Wire Products and Insulated Wire and Cable.

DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING.

Vol. 7 November 1932 No. 11

Designated as

**Official Publication By The Wire Association**


## Contents


**Lead-in Wires for Vacuum Tubes** ..... By Thos. F. Faulhaber 379
Unusual Welding Methods for "two-piece" Welds and "three-piece" Welds for Electrical Conductors for Lamps, Radio Tubes, etc., Described in Detail.

**Wire Association Convention** ..... 382

**Lime in Wire Drawing** ..... By D. E. Washburn 385
The Essential Factors Necessary for a Lime for the Most Successful and Effective Use in Wire Drawing.

**Special Bronze for Telephone and Telegraph Conductors** ..... 387
Part II. Molding and Rolling.

**'Round the World with the Wire Industry** ..... 392

**Exports and Imports of Wire** ..... 394

**A Review of Recent Wire Patents** ..... 395



—ASSOCIATE EDITORS—

W. H. Spowers, Jr., Consultant on Galvanizing

L. D. Granger, Chief Metallurgist, Wickwire Spencer Steel Corp.

Lancaster, Allwine & Rommel, Consultants on Patent Information

European Correspondents

Great Britain
A. C. Blackall
7 Vincent Sq. Mansions
London, S. W. 1, Eng.

Germany & Belgium
Paul Fidrmuc
Chapeaurougeweg 15
Hamburg, Ger.



R. E. Brown, Business Manager

Executive and Editorial Offices:

17 E. 42nd St., New York City. Telephone: Murray Hill 2-4188

Publication Office: Washington, N. J.

Annual Subscription, U. S. $5.00, Canada $5.60

50 Cents a Copy Issued Monthly Foreign, $7.50

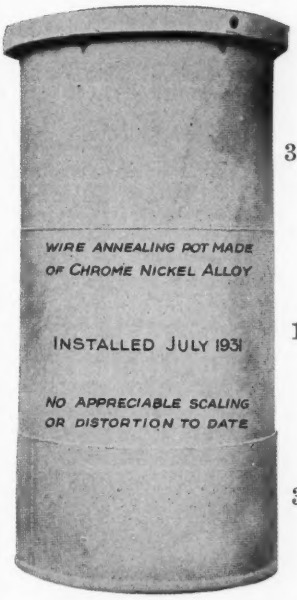


Copyright, 1932



Wire Annealing Pots
Galvanizing Kettles
Annealing Boxes

Steel Plate and
Chromium Nickel
Construction




National Wrought
Iron Annealing
Box Co.

Washington, Pa.

Since 1895



WIRE & WIRE PRODUCTS, Vol. 7, No. 11, November, 1932. Executive office, 17 East 42nd St., New York, N. Y. Published by the Quinn-Brown Publishing Corp., Richard E. Brown, President; R. S. Spengel, Secretary and Treasurer. Publication office, 49 E. Washington Ave., Washington, N. J. Subscription price: U. S., $5.00; Canada, $5.60 per year, 50 cents per copy; Foreign, $7.50 per year. Entered as second class mail at the Post Office, Washington, N. J., under Act of March, 1879. Copyright, 1932, by Quinn-Brown Publishing Corp.

# DON'T BE ECLIPSED!

## Here comes NEW LIGHT on DIES

## Come out of the darkness with RĀMET DIES

TRADE MARK REG. U.S. PAT. OFF.

**(TANTALUM CARBIDE)**

The advantages gained by the use of carbide dies over chilled iron dies are greater production per machine unit, greater efficiency from labor, more uniform gauge, ability to draw at higher speeds and decreased cost of die maintenance and replacements.

### A typical user says:

"Our comparison of Rāmet dies can be made only against tungsten carbide dies.

"We have found that the wearing of tungsten carbide is affected very materially by the cobalt content. When this cobalt is increased to the high limit, the wear is about the same as Rāmet but such a die is so extremely brittle it is very apt to crack.

"With normal cobalt content, we would say the wear of tungsten carbide, drawing seamless nickel tubing of small diameters, is approximately half as long as Rāmet. The throat of Rāmet die remains in much better condition and smoother work is obtained throughout the life of the die." Send for current price list.

## DIAMOND DIE COMPANY OF AMERICA

254 West 31st Street, New York, N. Y.

BEST QUALITY STEEL SET DIAMOND DIES AT GREATLY REDUCED PRICES

W & WP 11 Gray

# WIRE & WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip.
Wire Products and Insulated Wire and Cable.
DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 7 NOVEMBER, 1932 No. 11


# Lead-In Wires For Vacuum Tubes


By Thos. F. Faulhaber, Treasurer

Electro-Metals, Inc., Cleveland, Ohio


**Unusual Welding Methods for "two-piece" Welds and "three - piece" Welds for Electrical Conductors for Lamps, Radio Tubes, etc., Described in Detail ▼ ▼ ▼ ▼**

A LITTLE known and much used wire product is in almost every home today. It is the electrical conductor which carries the current into your lamps and radio tubes. Considering the many millions of these light bulbs and tubes made each year, the wire industry may find it of interest to know more of this specialty.

✦ ✦ ✦

## Product

THERE are principally two main classes of these products known to the industry as "welds". These are "two piece" welds and "three piece" welds, so named because they are made up of either two or three different pieces of wire. To know this product we must digress from "welds" to copper-clad wire, which is the common name of a special alloy wire which is made to have the same radial and linear coefficient of expansion as does the glass used in these products. "Copper-Clad" wire is made to go through or seal into glass so that it will have properties which permit it to expand and contract through any temperature change, exactly the same, both in length and width as does the glass itself. Otherwise the wire expanding or contracting at a different rate from the glass would break loose from it and a small air leak would occur between the metal and the glass. Air would seep through this leak and your lights or tubes would burn out,—the filaments would become oxidized. For this reason copper-clad is one of the chief constituent metals of practically all welds. There is one other wire which can replace it. Platinum, because of its closely similar expansion properties to glass, is sometimes used in place of copper-clad. In early lamp and tube history much platinum was used in these products before the copper-clad alloy was devised. For this reason, copper-clad is sometimes still called "platinum substitute". This substitute sells for less than ten dollars a pound, which compared with platinum prices, explains in part your present low tube and lamp prices.

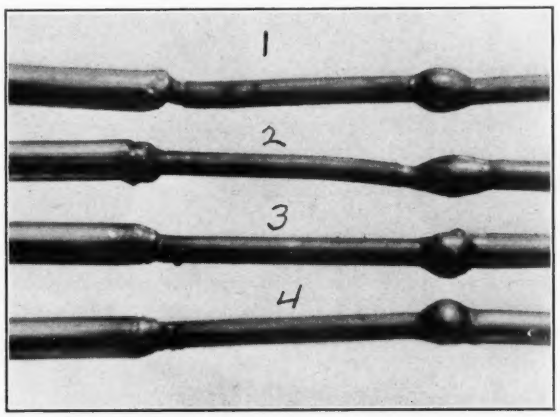



Fig. B—A microphotograph of 10 times natural size of (1 & 2) gas welded joints showing weakness due to tendency of molten metal to assume a spherical shape; (3 & 4) and electrically welded joints showing unaffected strength but rather crude looking (right side) copper to copper clad weld. ✦ ✦

✦ ✦ ✦

## Types

COPPER-CLAD wire is sometimes used as a single straight piece of wire to carry current

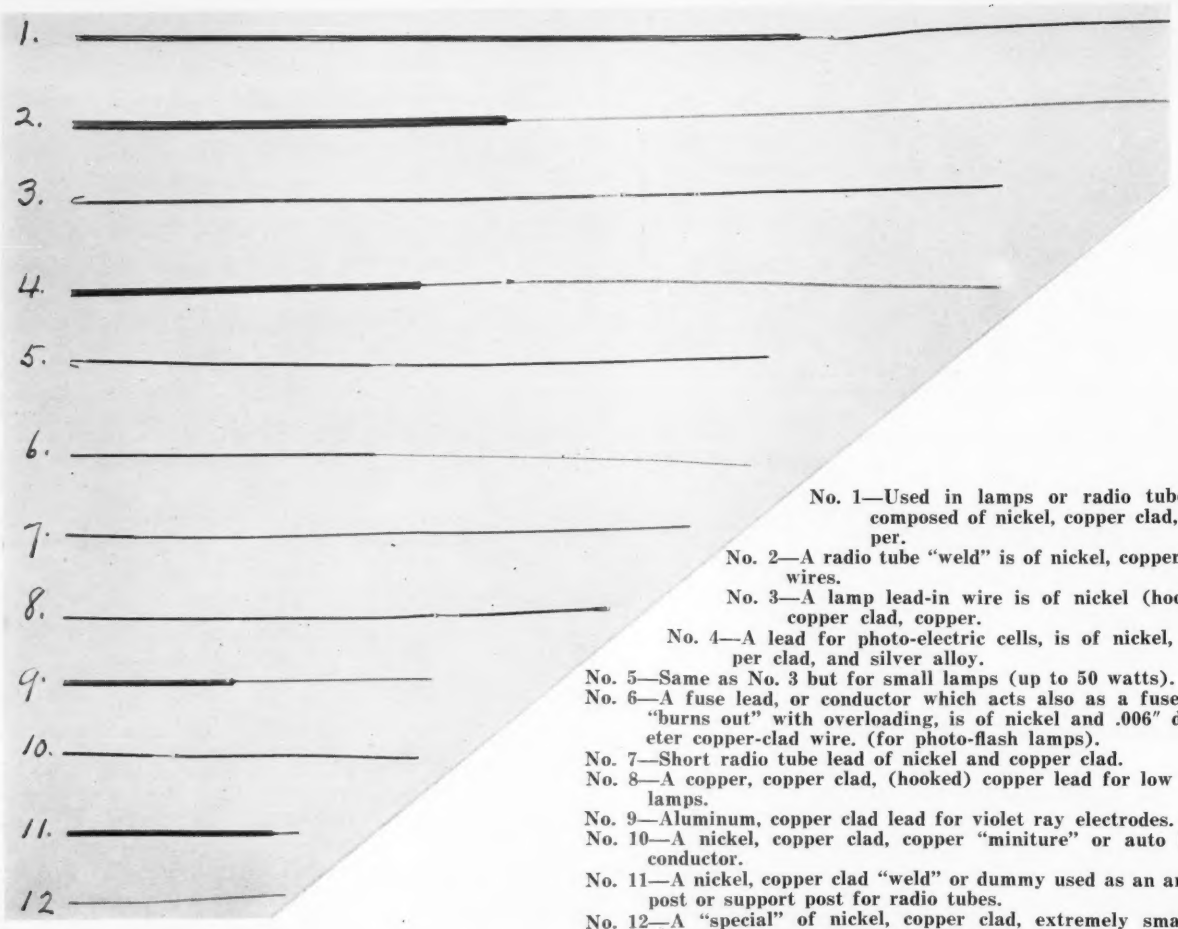



Fig. A—Twelve welded wires of various types and sizes; and composed of a number of different metals, which are listed at the right. ✦

No. 1—Used in lamps or radio tubes is composed of nickel, copper clad, copper.
No. 2—A radio tube "weld" is of nickel, copper clad wires.
No. 3—A lamp lead-in wire is of nickel (hooked) copper clad, copper.
No. 4—A lead for photo-electric cells, is of nickel, copper clad, and silver alloy.
No. 5—Same as No. 3 but for small lamps (up to 50 watts).
No. 6—A fuse lead, or conductor which acts also as a fuse and "burns out" with overloading, is of nickel and .006" diameter copper-clad wire. (for photo-flash lamps).
No. 7—Short radio tube lead of nickel and copper clad.
No. 8—A copper, copper clad, (hooked) copper lead for low watt lamps.
No. 9—Aluminum, copper clad lead for violet ray electrodes.
No. 10—A nickel, copper clad, copper "miniture" or auto lamp conductor.
No. 11—A nickel, copper clad "weld" or dummy used as an anchor post or support post for radio tubes.
No. 12—A "special" of nickel, copper clad, extremely small in length and diameters and both wire diameters being of the same size. Fine welds of various types such as this are used in small lamps for dental uses, "grain of wheat" tubes used in medical examination and for other special uses of a special character.

**There are, of course, other types and variations and metals, but these are most common.**

from the base, through the glass, and into the valve or tube. This has several distinct disadvantages however. First, this wire does not solder easily to the brass base or prong of the tube base, and must be scraped clean to make a good soldered contact. Second, this wire has much higher resistance than some other metals which can be used in its place inside and outside the glass seal. Third, this metal does not have desirable effects inside of types of tubes where it is necessary to eliminate gasses and set up certain conditions. Fourth, this metal has greater heat conductivity than other metals which may be used inside of a lamp or tube, thereby drawing the heat away so that not as high a degree of incandescent heat is attained by the filament wire with the result that the lamp burns less brightly. Last, other metals are much cheaper in price.

These reasons have given birth to the welded lead-in wire, or unit product of several wires assembled end to end.

✦ ✦ ✦

BELOW is a list of the various commonly used metalic wires which go to make up both the two and three piece weld, and their uses.

**2 Piece welds**

- Swedish iron to copper-clad, for neon sign electrodes.
- Nickel to copper-clad, for support wires and conductors in lamps, radio tubes, power tubes, etc.
- Aluminum to copper-clad, used in violet ray electrodes.
- Copper or nickel to copper-clad, for photoflash lamps.

**3 Piece welds**

- Copper—to copper-clad to nickel, used in lamps, tubes, and neon sign electrodes.
- Copper—to copper-clad to Manganese Nickel, for radio tubes.
- Copper—to copper-clad to molybdenum, for gas filled lamps.
- Silver-copper alloy to copper-clad to nickel for photo-electric cells, and special uses.

✦ ✦ ✦

## History

THE history of welding these wires goes back to Germany. Formerly all welds were "gas" welds or made in a gas flame. At first several wires were melted together by being held by hand in a gas flame. The natural evolution of the gas weld resulted in a small

automatic machine which would hold these wires in position and for a fixed length of time while the flame melted the ends together. Now "gas" welds are made on automatic machines which take in wire, cut it to size and weld the ends together, still, by exposing the ends to a melting flame.

✦ ✦ ✦

THE next step in weld evolution was made with the use of electricity for this welding. At first this too was a hand process in which two pieces of wire were "spot" welded together. This similarly evolved into a automatic machine which takes in wire on coils or spools, cuts it off to desired lengths, places two or three different wires end to end and electrically welds them together. These are then "extracted" by fingers of steel that open and close in a most human manner. These fingers drop the welds, one at a time, in a small trough outside the machine, at the rate of from two to four hundred a minute (depending on specifications of welds). The human eye cannot follow the movements of this machine at normal operating speeds.

✦ ✦ ✦

TODAY there are about half a dozen "weld" manufacturers in this country, and they are about evenly divided between the "gas" welding and "electric" welding process. The gas weld is more simple to make, it requires machines of much lower cost and maintainance, and of more simple construction. They work more slowly than the high speed electric machines, which cost very much more and are exceedingly complex and delicate.

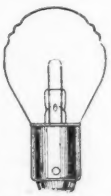
✦ ✦ ✦

THE quality of both types of welds is *very largely* dependent on the care and skill and patience of the operators and "Set-up" men. Both types of machines can produce evenly welded uniform products, or both can produce welds that are over or under exposed to flame or current and which are unevenly welded. Both quality of material and quality of labor in this industry are of great importance.

## Pro and Con

I BELIEVE there are attendant advantages and disadvantages to both types of processes, as follows:

The gas welding machines can be set up for less cost and more easily than can the electric, and are therefore capable of getting out small quantity orders on a profit basis that would mean a loss to an electric welding firm. However the heat or smoke from the gas flame usually discolors the metal about the welded joints more than does the electric current. This flame also, sometimes burns away a portion of the "borating" on the copper-clad wire. (This wire is "borated" to serve as a flux with



Miniature Lamp—The Dilco Lamp Works, Jersey City.

✦ ✦ ✦ ✦ ✦

the glass). In welding copper, the gas flame produces a more uniform and better looking copper "knot" or welded joint. The electric welder makes a "lap" weld at this joint which usually slightly flattens the metal on one side. The other electric weld (the one used on a two piece and one of the two used on a three piece) is a "butt" weld. I believe that the chief advantage of an electric weld is that it is capable of making a stronger welded joint than does the gas flame. We all know that molten metal tends to become spherical in shape and draws the flowing metal about it into a "ball". Therefore if we use a gas flame to melt our metals its flame spreads to some extent on either side the welded joints and melts the metals on either side. This tends to draw the melted metals on either side to the joint thus thinning and weakening the wire at those points. (See Fig. B). The electric process, because it is almost instantaneous, and because it can be applied and held to a very limited area, overcomes this difficulty. This very factor of limiting the heated area is that which results in the electric weld being less round and presentable at the lap welded joints, however. Also because of this factor it is possible to make smaller and finer welds by the electric process. We have welded wires (electrically) as small as .006″ diameter (about 34 B&S) and as large as .060″ diameter (about 15 B&S). We have also welded pieces of metal as short as 2 millimeters and well over 100 millemeters long.

✦ ✦ ✦

## Usage

ELECTRIC welders usually recommend about .066″ difference in wire diameters for the best strength of metals, and ease of handling. A typical weld would be made of .020″ copper, .014″ copper clad, and .020″ or larger nickel, or, similarly of .022″ copper, .016″ copper-clad, and .022″ or larger nickel. This also permits of easier welding by both processes as it is easier to adjust the wires to meet exactly if one is larger than the other. Looking at the number 12 weld of figure A you will notice a weld of copper-clad and nickel, both wires being of .012″ diameter. This can be done and done well, and though difficult is sometimes necessary. (Incidently please notice the extremely short nickel on this weld).

✦ ✦ ✦

## Quality

WELDS have been used for quite a few years, yet occasionally a manufacturer experiences "quality" troubles due to "air leakers" or copper-clad wire containing an air vane or minute hollow throughout its length, or having a wrong coefficient of expansion causing a leak between the glass and wire. When such a wire is sealed into a tube it may leak slowly so that it is not detected at the factory, with resultant losses of good will and returned merchandise. If the leak is sufficiently pro-

(*Please turn to page 402*)

# The Wire Association Annual Meeting and Exhibition

## Some High-Lights of the Recent Wire Association Annual Meeting at Buffalo

✦ ✦ ✦

## The Value of the Association as a Common Meeting Ground for the Exchange of Production Data Fully Proven at these Sessions

AN attendance of over 200 wire men coming from all parts of the United States, Canada and several European countries, at the recent meeting of the Association held at Buffalo, N. Y. Oct. 3rd to 7th inclusive, demonstrated the wide interest in the work of the Association throughout the industry.

✦ ✦ ✦

AT the technical meetings, a very comprehensive program was presented including papers on the following subjects:

**"Copper Rod Rolling, Wire Drawing and Annealing."**

**"Process Control in the Manufacture of Rubber Covered Wire."**

**"Plant Management."**

**"Cost Accounting."**

**"Patenting."**

**"Material Handling."**

**"Production of Stainless Hot Rods."**

✦ ✦ ✦

IN connection with the presentation of the various papers, over twenty-five questions on various processes were discussed. This was a complete change from the method of conducting the meetings of previous years and **Mr. R. K. Clifford, General Superintendent, Continental Steel Corp.,** Chairman of the Program Committee, in his opening address describing this plan, stated:

"Gentlemen: The Wire Association is yet young. To date the annual meetings have been more or less patterned after those of a number of the older technical societies, in which the conferences consist primarily of specially prepared papers or reports, together with prepared discussions. In most such meetings there is very little, if any, spontaneous discussion from the floor. The members in attendance, realizing that they can at their leisure, read the papers and discussions in the society publications, are consequently inattentive and generally hard put to remain awake.

Recently there has been a growing tendency toward developing meetings of industrial groups into real conferences by promoting live round table discussions on practical production problems, leaving the highly technical subjects for publication in the journals. Prepared papers still play an important role but are used to round out discussions rather than to furnish the entire backbone of the meetings.

RALPH K. CLIFFORD
General Supt., Continental Steel Corp., Kokomo, Ind.
Chairman, Wire Association Program Committee.

In organizations employing this newer, and we believe better, method of conducting meetings, it has been found that at first the greater number of those in attendance are content to sit and listen, not willing to contribute their share to the discussion, but eager enough of course to secure information from others. It has also been found, fortunately, that this condition does not long exist. This is true because the great majority come to the realization that, after all, we **profit** in **direct** proportion as we **serve.**

We hope that each one of you here today will enter into the spirit of the meeting and contribute your share to the discussions. We are sure you will be amply repaid and will feel that your efforts have been justified.

There will probably be questions raised upon which you may feel that you cannot, in justice to your respective managements, give information. In such instances you should feel that you know each other well enough to frankly state that you would rather not discuss the subject.

In some of the kindred organizations it has been found that, sometimes, the more enthusiastic exponents of specific practices are prone to make exaggerated statements and claims. However, as the members become better acquainted they come closer to the truth and the meetings become more truly beneficial.

After all, one of the greatest of all benefits to be derived from our meetings is in getting to know each other better. We should by all means widen our acquaintance among men in our own lines of endeavor.

It is the idea of the programme committee that, in future years, the questions for discussion originate with the membership at large. However, in order to get the ball rolling, the committee has collaborated in preparing a list of topics for all the present meetings, dividing them as best it could, into various groups. You will, of course, realize that we can but scratch the surface at present, but we feel confident that each succeeding year will find our meetings growing more and more interesting and informative and that you will be able to show real dollars and cents savings in your business as a direct result of your attendance here."

✦ ✦ ✦

THIS method of handling the meeting was found to be most satisfactory, resulting in many spontaneous discussions, bringing out many original ideas and much valuable data. The frankness of the speakers brought out some real differences of opinion and was not only most instructive, but in many instances very amusing.

Credit for much of the liveliness of these meetings must be given to Kenneth B. Lewis, who always had the right thing to say at the right time.

✦ ✦ ✦

**THESE discussions will not be published in WIRE & WIRE PRODUCTS as has heretofore been the case, but will be presented in the form of a typewritten booklet entitled "Proceedings of the 1932 Wire Association Meeting." Copies of this booklet can be obtained for $2.50 each by addressing the Secretary of The Wire Association, 17 East 42nd Street, New York, N. Y.**

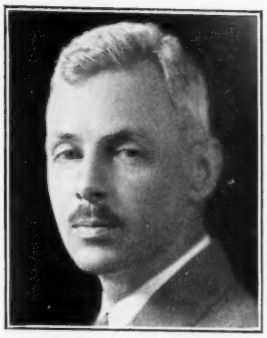
✦ ✦ ✦

AT the conclusion of the technical discussions, the annual meeting of the Wire Association was held at the Hotel Statler, John Mordica, Supt. Rod & Wire Mills, Bethlehem Steel Company, Sparrows Point, Md., President of the Wire Association, presiding.

✦ ✦ ✦

IN his opening address Mr. Mordica said: "Above all, I believe in the Wire Association and the work it is doing and I personally want to see it grow and improve.

"This year's attendance was not as great as in former years as a great many of our men were for various business and personal reasons forced to remain away. This was not due to any lack of interest but purely for economic reasons and it is particularly noteworthy that most of the companies represented at last year's meeting with several members in attendance were all represented this year by at least one man.

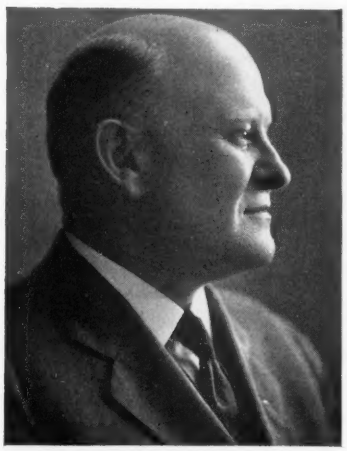


KENNETH B. LEWIS

Wire Mill Engineer, Morgan Construction Co., Member Wire Association.

"The discussions this year were so successfully handled and so much of interest was brought forth in the meetings that I look forward next year to the largest attendance we have yet had.

"I want to say to you men who have spent the time and taken the trouble to participate in these meetings and the preparation of this program, that you are deserving of a lot of thanks for the splendid job you have done. I do not know that I have ever heard more interesting subjects and I know that all of us who attended were much benefited and interested. I feel that if every man who attended these meetings will just go out with the feeling that this Association is a fine thing, that it has helped him and will continue to do so and that if he will take the slight trouble necessary to interest other men in his company and other companies in a membership, will justify the work we are doing and shall continue to do. This is not a difficult thing and I want to impress on each one of you here the opportunity and obligation to do this for the benefit of the association and yourself as well."



JOHN MORDICA

Supt. Rod & Wire Mill, Bethlehem Steel Company, Sparrows Point, Md. President, The Wire Association.

The officers, directors and program committee feel very much encouraged at the results obtained so far and I am certain that we have only just started on the road to a big success.

"At the time this Association was organized we were greatly handicapped as the country had just then plunged into the depression which has lasted up until now. In spite of this handicap the creation of this organization was so needed that it has made wonderful progress both in membership and in operation.

"It is of interest to note in this connection that while practically every other Association shows a material decrease in membership during the past year, we have shown a considerable increase.

"There will come up at this meeting today some discussions which are very important to our next meeting and your earnest consideration of these matters is requested. Personally, I am going to do everything I possibly can toward the improvement and development of our association and I request your cooperation to this end."

✦ ✦ ✦

IN addition to the details of interest exclusively to members of the Association and which will be sent to them in the form of a bulletin, several matters of general interest to the wire industry as a whole, were discussed.

✦ ✦ ✦

AMONG these was the report of the Industrial Procurement

Planning Committee relating to the survey now being made for the War and Navy departments to ascertain the productive capacity of each individual mill in the case of a national emergency.

✦ ✦ ✦

THE report of this committee was presented by Mr. L. D. Granger, Chairman of Wickwire Spencer Steel Company, and may be briefly summarized as follows:

As a result of the attendance at the Wire Association meeting at Cleveland, Ohio in 1931 by District Procurement Officers of the Supply Division of the Signal Corps, U. S. Army, together with 1st Lieut. Frank W. Bullock, Signal Corps., U. S. Army attached to the office of the Assistant Secretary of War, and at that time Chairman of the War Department Wire & Cable Commodity Committee No. 51, a joint meeting of the general boards of the Army and Navy was held at Washington and as a result the Wire Association was requested to ascertain for the use of War Department only, the ability of the wire industry to meet requirements in the event of a national emergency.

A letter of authoriatzion was subsequently received from the Honorable F. H. Payne, Assistant Secretary of War in Charge of Procurement Planning. As a result of this official authorization, the President of the Association appointed Mr. L. D. Granger of the Wickwire Spencer Steel Company as Chairman of this Committee and Major Richard E. Brown, Spec.-Res., U. S. A., Secretary of The Wire Association, as Secretary of the Committee.

In explanation, the War Department has a number of Commodity Committees. The mission of these Committees is to collect, collate and affiliate all data pertinent to the items assigned to them and to allocate to the different divisions of the military services, certain plants to meet their emergency requirements.

Commodity Committee No. 51, controls Wire, Cable and Gutta-Percha. This committee is active at this time, as wire and cable presented one of the major supply problems in the last war and it is

**L. DWIGHT GRANGER**
**Vice President, The Wire Association**
**Asst. to Vice-Pres., Wickwire Spencer Steel Co.**
**Treasurer, American Wire Fabrics Corp.**

necessary to secure data as to the productive capacities of the various mills at this time in order to avert the same difficulty arising in the event of another national emergency.

The War Department has assigned Major. R. E. Brown, Spec.-Res., U.S.A., attached to the office of the Chief Signal Officer, War Department, Washington, D. C., to collect and transmit the data supplied by the mills under this survey.

**Under this arrangement, all information received is held in strict confidence and immediately transmitted to the office of the Chief Signal Officer, Washington, D. C. Not even members of the Committee have access to this data.**

To secure the information desired, each company is being mailed a compilation of the emergency requirements of the Government together with two forms for them to fill out and return.

✦ ✦ ✦

BETWEEN September 1st and September 30th, one hundred and twenty-five of these tabulation sets were mailed out by Major Brown and the work will be continued until such time as the entire survey of the industry is covered.

✦ ✦ ✦

IN the event of any mill desiring to be placed on the list of bidders of any of the Military Departments purchasing wire or wire products in peace time, Major Brown has been authorized to conduct the negotiations and correspondence with and for such plants and will see that satisfactory arrangements are made for them with the different Procurement services.

✦ ✦ ✦

AFTER the presentation of this report, Major Brown, outlined some of the difficulties to be solved by the War & Navy Department in connection with procuring wire of special types.

✦ ✦ ✦

FOLLOWING Major Brown, Captain Charles T. McAleer, the present Chairman of War Department Wire & Cable Commodity Committee No. 51 of the Office of the Assistant Secretary of War, described the situation from the standpoint of the officers authorized and directed to control purchases and a copy of his address will appear in the December issue of WIRE & WIRE PRODUCTS.

✦ ✦ ✦

A discussion followed regarding the 1933 meeting and three idea were submitted.

1. To continue with the National Metal Congress.

2. To hold a separate meeting at Atlantic City with an exhibit.

3. To hold the next meeting in the form of a short trip to Bermuda.

The concensus of opinion seemed to indicate the desirability of continuing the association with the National Metal Congress. This will be submitted to the entire membership of the Association by mail to vote on in the near future.

For the next meeting it was also suggested that the program be confined to three days, each day to have one session starting in the morning at 9:30 A. M. and to carry over to the afternoon in the event that those present at the meeting wanting so to do. It is further proposed to arrange a plant inspection trip to some modern wire mill in connection with the meeting.

(*Please turn to page 400*)

# Lime In Wire Drawing

By D. E. Washburn

Chief Chemist, American Lime & Stone Co., Bellefonte, Pa.

## The Essential Factors Necessary for a Lime for the Most Successful and Effective Use in Wire Drawing

THIS discussion embodies a technical lime man's ideas relative to the essential factors necessary for a lime product to most successfully and effectively serve the wire drawing industry. Naturally, it is given by one who has devoted more thought and study to the technique involved in the manufacture of lime than in wire drawing. However, with the knowledge that the main prerequisites involve the absence of grit and the preservation of adhesion, coverage and chemical composition, we will proceed to develop these items in the order mentioned.

✦ ✦ ✦

### Grit

WHILE both quicklime and hydrated lime are employed in wire drawing, the quick-lime tonnage is by far the greater. Therefore, this discussion will relate principally to quicklime. Any grit present must of necessity be largely of a siliceous composition due to calcium oxide and silica combining under the favorable influences of high temperatures to form silicates of lime along with the possibility of minor quantities of iron and alumina entering into the reaction. Inasmuch as lime and silica constitute two of the main items which, when subjected to high temperatures enter into the production of glass and slags, it is readily perceivable why undue amounts of silica are favorable to the production of abrasives which, of course, will result in worn dyes and etched wire.

✦ ✦ ✦

PRACTICALLY all quicklimes are calcined from native limestones, none of which are entirely free from silica. They may even contain silica in the form of small quartz crystals which are in themselves abrasives. Geologists claim that originally all the calcium in our limestones was primarily of igneous formation, later to be dissolved out by water containing carbon dioxide and deposited through the intermediaries of living organisms, and through chemical and mechanical means, as a carbonate sediment, which, subjected to enormous strains and stresses, mummified and solidified into our secondary limestone ledges of today. All this, of course, may appear merely of geological interest, but it was part of a gigantic drama enacted possibly more than one-half a billion years ago. The primary igneous rock formation must have been highly siliceous, and to the wire drawer of today, it matters profoundly as to the nature and amount of the abrasive forming material that was carried over from the primary formations into the secondary limestones. If the amount was small, consisting of exceedingly fine particles, widely distributed, it is quite possible that lime manufactured from such a source will be reasonably free from grit, and any remote possibility of serious grit trouble can be entirely eliminated through intensive fine grinding. It will be recalled that the fine grinding, even of sand, if carried far enough, will convert it from a scratchy material into a polishing agent. Supergrinding can even bring about a colloidal fineness which, applied to dyes and wire, would have no measurable wearing action over a long period of time.

✦ ✦ ✦

ASIDE from the inherent silica just discussed, there is the additional source from outside contaminations, such as quarry dirt and kiln linings. The former source can be eliminated through improved methods of quarrying, such as mining. The latter source cannot be entirely eliminated, as it is impossible to manufacture lime without hot contacts with kiln linings. With the use of modern equipment, however, such as the modern rotary kiln, supertemperatures can be avoided and hot contacts limited to a minimum. A lime produced under such conditions can be properly selected so that the intensive grinding already referred to will eliminate anything remotely serious.

✦ ✦ ✦

### Adhesion

WHY certain limes adhere better than others and produce more uniform coatings of finer texture without scaling or flaking is not precisely or definitely known. That they do, however, is plainly evident from observations in the production of lime-sand mortars for masonry and plastering.

✦ ✦ ✦

APPARENTLY, for some reason, the calcium hydroxide, which constitutes the bonding agent, possesses a higher cementing property and a better consistency which allows it to spread over a larger area and still retain sufficient adherence. Both the texture of the limestone from which

the lime is manufactured and the methods of manufacture may have an important bearing on the adhesion property. If the limestone possesses an unusually fine crystalline texture, bordering on the amorphous, this subdivision of ultimate particles is bound to be reflected in a finer dispersion of colloidal particles in the milk of lime.

"In common with all substances which are dispersed in water to particles of colloidal size, slaked lime on drying has considerable binding action." It is, therefore, reasonable to assume that the adhesive value bears some direct relation to the colloidal size of particles, and that the finer the particle, the more perfect the adhesion. If, therefore, this inherent property to produce unusual colloidal sizes is not destroyed through faulty methods of manufacture, such as excessive and prolonged burning, the coating on the wire should be ideal for wire drawing. Through carefully controlled burning the quality of the coating should be further increased.

✦ ✦ ✦

## Coverage

EVERYTHING else being equal, it is axiomatic that the most economical lime for wire drawing is the one which per unit weight of lime will cover the greatest wire surface.

✦ ✦ ✦

LIMES vary in their covering ability. One lime may produce as high as 30% more volume of putty per unit weight of lime employed than another lime. The coating on a wire is nothing more than the putty content dispersed as a lime pigment in water as a vehicle, and deposited on the wire surface similar to what a paint pigment would be, using oil as the vehicle. Naturally, therefore, the lime capable of yielding the largest volume of putty will furnish the most pigment and cover the greatest area.

✦ ✦ ✦

IN the manufacture of lime, extremely high and prolonged temperatures have a tendency to limit the putty yield. Evidently the putty yield is also largely influenced by factors related to particle sizes, and the treatment which produces the greatest number, the smallest sizes, and the lowest densities will be the most economical from a coverage standpoint. These properties can be determined through simple tests, such as settling tests which will show the volume of putty yield as well as indicate particle size and density. It might be well for the practical wire drawer to give this test some consideration.

✦ ✦ ✦

## Chemical Composition

IT is difficult to prescribe any definite limits under this heading. As the essential ingredient is calcium oxide, it probably should not contain less than 94% of this item, with magnesium oxide and silica each below 2% and other impurities below 1%.

✦ ✦ ✦

CARBON dioxide, which is an indication of how completely the lime has been burned, should be 1½% down to about .60%. A lime too low in this item would indicate temperatures detrimental to the valuable properties already discussed.

✦ ✦ ✦

OF late, the item of combined water has turned out to be a very important one. Combined water in a quicklime is a measure of the air-slaking which has taken place since the lime was manufactured. It indicates the presence of calcium hydroxide, and it is perplexing why it is detrimental since eventually calcium hydroxide must constitute the coating on the wire, but air-slaking produces different physical properties than does the slaking of a fresh quicklime with water. It has no appreciable bonding property, and to some extent, imparts its inertness to the otherwise active calcium oxide with which it is associated.

✦ ✦ ✦

THERE occurred one failure during the past year which almost certainly was due to air-slaking and another which was definitely traced to this cause. Wire coating produced from such material appears very uniform, running very thin to very heavy, with some pinhead size particles showing. A quicklime should analyze down around 2% or below in combined water.

✦ ✦ ✦

MENTION was just made of "inertness" in connection with air-slaked quicklime. Fine grinding was also mentioned earlier in the discussion. It appears that exceedingly fine grinding likewise has a retarding effect on the slaking of a quicklime, but fine grinding is an asset provided the quicklime, before it is ground, consists of the unusual quick slaking variety. Pulverizing a slow slaking product is liable to rob it of that initial quick heat so essential to start and complete the slaking action.

✦ ✦ ✦

IN your preliminary discussion on the floor, some gentlemen made reference to the use of hydrated lime for wire drawing. Consequently, before concluding this discussion I consider it advisable to state that from an economical standpoint it requires 44 lb. of the best hydrates to yield one cubic foot of putty. In contrast, there are quicklimes, 25 to 30 lb. of which will yield one cubic foot of putty and a very occasional one of which 18 to 20 lb. will yield one cubic foot of putty. Unless there are some other tremendous compensating factors to justify hydrated lime, it appears that a high putty yielding quicklime will by far produce the greatest amount of coating.

✦ ✦ ✦

A most interesting discussion on the use of lime in wire mills occurred in connection with the presentation of this paper at the recent Wire Association meeting.

✦ ✦ ✦

Stenographic Copies
of the
Discussions on All Papers
Presented at the
Association Meetings
Are Obtainable
At $2.50
From
THE WIRE ASSOCIATION
17 East 42nd Street New York, N.Y.

# Special Bronze For Telephone and Telegraph Conductors

## PART II - MOLDING AND ROLLING

Translated from Chemisch-Metallurgische Zeitschrift of August 8, 1931

By Samuel J. Rosch, Cable Engineer
Anaconda Wire & Cable Co., Hastings-on-Hudson, N. Y.
Assisted by Otto F. Jagielski, Consulting Wire Mill Engineer

THE best type of mold is an iron mold, specifically used in the case of casting cannons, with a diameter of 110 mm. and a length of 1000 mm. The ingot then produced weights about 90 kgms. Using a crucible containing 180 kgms. will yield two such ingots. Larger quantities than 180 kgms. per crucible are not feasible since the alloy must be poured very hot. The pouring of more than two ingots from a larger capacity of molten metal, would require too long a period of duration. In that case, when the last ingot is being poured, the alloy would be too cold to be able to produce an ingot with unobjectionable features. Fig. 1 shows a cannon mold and Fig. 2 the pouring funnel used with this mold.

✦ ✦ ✦

THE mold must be very smooth inside, in other words, the interior must be perfectly machined or ground. Every bit of unevenness in the surface of the interior makes the withdrawal of the ingot from the mold more difficult and also tends to lower its quality as will be discussed later. Before each pouring, the interior should be cleaned with a good round wire brush after which, a mixture of petroleum and lampblack is to be smeared on the inside.

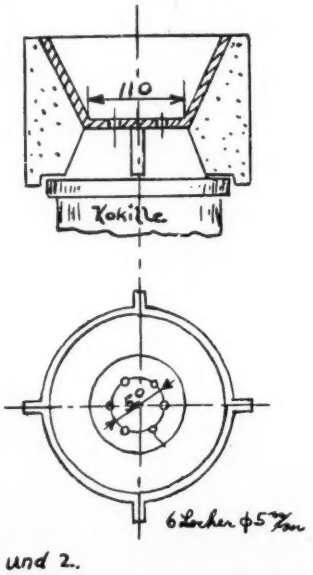



FIG 1 und 2.

✦ ✦ ✦

THE use of a pouring funnel is unavoidable first of all, to prevent the slag or dross from staying within that part of the ingot contained in the mold and secondly, to obtain central pouring. It is very difficult to pour directly from the crucible into the mold and still be able to so lead the stream of metal without splashing against the walls of the mold. On those spots where the stream of metal hits the sides of the mold, a very lively formation of gas occurs. The result is that on these spots, the ingot possesses innumerable pores and holes. The wire which is drawn from such ingot, does not conform either to the required tensile, bending or torsion. Besides this during the cold drawing of the wire, it has a tendency to scale and produces a very rough appearing surface. Through the use of the funnel, however, all of these objections are removed. The molten metal pours central in the mold without first touching the walls of the mold. It is, however, well to note, that the pouring is so rapid, that the funnel is always full of hot metal.

✦ ✦ ✦

WHEN the mold has been poured full, the funnel is removed. In the gradual cooling of the ingot in the mold, an opening forms which with careful additional pouring can be prevented. If additional pouring is not made use of, then during the cooling, this opening may form right down to the middle of the ingot. Fig. 3 shows the formation of such an opening. The wire drawn from such ingot has in the center a very fine hole. On account of this hole, the cross section is weakened and would not yield the required results during the tensile or bending tests.

✦ ✦ ✦

THE molds are best arranged in a pit in groups of 10. It has been shown that the success of the group depends on the maintaining of the maximum heating during pouring. Cold pouring, or bad molds, yield ingots with rough surfaces. Such ingots produce rods which during wire drawing produces scale on the drawn product.

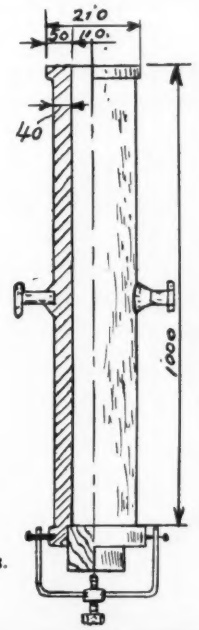



Fig. 3.

# Save on Your

# Winding Costs

## With Winco PRODUCTS FOURX Enameled Wire

▲ ▲ ▲ All wire meets the most exacting requirements ▲ ▲ ▲

Winco PRODUCTS 4X Enameled Wire has been developed to replace single silk covered and single silk over enameled wire in the winding of small motor armatures, fans, high frequency radio transformer coils and other apparatus where high insulation values and ability to resist abrasion, are prime factors.

▲ ▲ ▲

Winco PRODUCTS 4X Enameled Wire is covered to the same dimensions as the fabric covered wires, and can therefore be wound without changes in armature slots, bobbins or winding jigs.

▲ ▲ ▲

Is superior in its ability to withstand high temperatures.

▲ ▲ ▲

Will withstand softening in the varnish dipping and baking operations.

▲ ▲ ▲

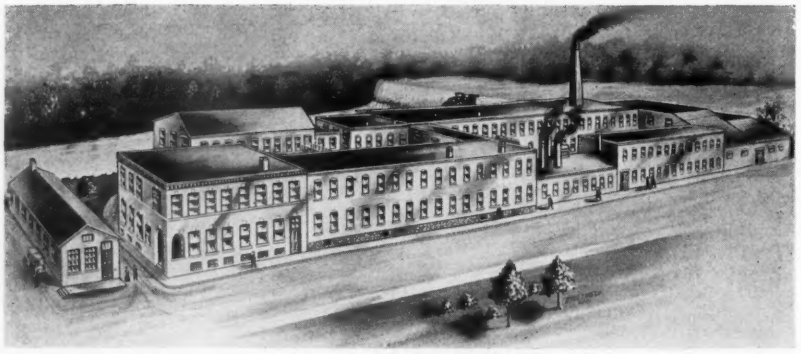
Requires little or no change in winding practice.

▲ ▲ ▲

Costs substantially less than the silk covered wire.

▲ ▲ ▲

Write for samples.



GENERAL VIEW OF PLANT, WINSTED, CONN. ▲ ▲ ▲

Products of leakage currents attack insulation and shorten the life of the coil. ▲ ▲

The only test indicating what the leakage loss in a winding may be is the test in mercury, which reveals the weak spots in the enamel covering. ▲ ▲ ▲

Our method of testing all wire by mercury test before shipment is calculated to give the user the highest degree of protection. ▲ ▲ ▲

ALL Winco PRODUCTS WIRE

GUARANTEED LEAK PROOF ▲ ▲ ▲

**We would be pleased to quote on your requirements.**

## WINSTED INSULATED WIRE COMPANY

Incorporated

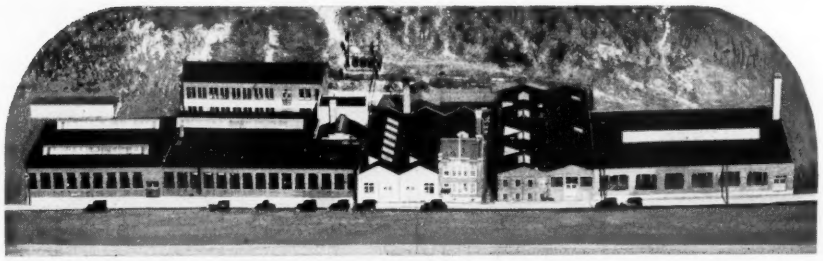
Winsted, Connecticut

# "HUDCO" PRODUCTS...

# Specially Processed Copper Wire...

## For Enameling Purposes...

### ▲ ▲ ▲ Electrolytic and Oxygen Free ▲ ▲ ▲



AERIAL VIEW OF PLANT OF HUDSON WIRE CO., OSSINING, N. Y. ▲ ▲ ▲
▼ ▼ ▼ FINE WIRE MANUFACTURERS ▼ ▼ ▼

## "HUDCO" High Conductivity Electric Wire

OTHER FINE BARE WIRES

High Brass, Low Brass, Zinc 99.99+ and High Tensile Zinc, Commercial Bronze Phosphor Bronze, Pure Tin, Lead, Antimonial Lead, Cadmium, 10%, 18% and 30% Nickel Silver, Silver Plated Copper, False Gold and Special Brass and Bronze Alloys to Specification.

BRUSH WIRES, CRIMP and STRAIGHT

Brass, Steel, Nickel Silver, Copper and Phosphor Bronze

TINSEL LAHNS

Silver Plated Copper, False Gold and Copper

METALLIC FIBRE FOR PACKING PURPOSES

Copper, Bronze, Zinc, Lead and Aluminum

WIRES FOR METAL SPRAYING

Zinc, Tin, Lead, Cadmium, Copper, Bronzes, Nickel Silver, Aluminum and other wires to specification.

ROLLED FLAT WIRE WITH ROUND EDGES

Copper, Brass, Nickel Silver, Zinc, Lead, Phosphor Bronze and other wires to specification.

"Hudco" copper wire is drawn by the Hudson Wire Company of Ossining, N. Y., who have been specialists in the manufacture of fine wires for over thirty years. ▲

The best grade of copper drawing stock is used, insuring the maximum conductivity. ▲ ▲ ▲

A new process of drawing and annealing is used which produces a wire unusually smooth, clean and uniform in color for enameling and other purposes. ▲ ▲ ▲

Painstaking care in the selection and maintenance of dies guarantees a product accurate to gauge and resistance. ▲ ▲ ▲

You can rely on "Hudco" wire always. ▲ ▲ ▲

Expert annealing of the wire prevents unnecessary breakage when winding the wire into coils ▲ ▲ ▲

If you, too, have a specific problem demanding wire of exact requirements, write to us about it. ▲ ▲ ▲

It costs nothing and involves you in nothing. ▲ ▲ ▲

Better wire at lower cost. ▲ ▲ ▲

**We can serve you quickly and economically.**
**Send in your specifications for a quotation.**

"HUDCO" FINE WIRES

## HUDSON WIRE COMPANY

Ossining, N. Y.

Estab. 1902 — Successors ROYLE & AKIN — Estab. 1902

"HUDCO" FINE WIRES

TABLE NO. 2

| | From | To | % Reduction in Cross-section |
|---|---|---|---|
| 1. | 110 mm. round | 90 mm. sq. | 15% |
| 2. | 90 mm. square | 81 " " | 19% |
| 3. | 81 " " | 71 " " | 23% |
| 4. | 71 " " | 63 " " | 21% |
| 5. | 63 " " | 55 " " | 23% |
| 6. | 55 " " | 48 " " | 15% |
| 7. | 48 " " | 42 " " | 23% |
| 8. | 42 " " | 70x25 mm. oval | |
| 9. | 70x25 mm. oval | 28 mm. sq. | |
| 10. | 28 mm. square | 50x17 mm. oval | |
| 11. | 50x17 mm. oval | 18 mm. square | |

TABLE NO. 3

| | | |
|---|---|---|
| 67 x 35 | 49 x 27 | 36 x 20 |
| 46 x 17 | 29 x 11 | 18 x 7 |
| 58 x 32 | 29 x 11 | 18 x 1 |
| 36 x 14 | 42 x 23 | 28 x 17 |
| 53 x 28 | 25 x 9 | 16 x 6 |
| 33 x 13 | 29 x 9 | 16 x 6 |

TABLE NO. 4

| | | | |
|---|---|---|---|
| 40 mm. round | 13 mm. square | 11 mm. square | 9.0 mm. square |
| 15 mm. square | 28 mm. round | 20 mm. round | 9.0 mm. square |
| 36 mm. round | 12.5 mm. square | 10.5 mm. square | 8.5 mm. square |
| 14 mm. square | 12 mm. square | 10 mm. square | 8.0 mm. square |
| 32 mm. round | 24 mm. round | 18 mm. round | 7.0 mm. square |
| 13.5 mm. square (see Fig. 6) | 11.5 mm. square | 9.5 mm. square | 6.5 mm. square |

TABLE NO. 5

| | | | |
|---|---|---|---|
| 25 x 11 | 18 x 6 | 16 x 5 | 15 x 4.5 |
| 23 x 10 | 18 x 6 | 16 x 5 | 15 x 4.5 |
| 22 x 9 | 18 x 6 | 15 x 4.5 | 13 x 4 |
| 18 x 6.5 | 18 x 6 | 15 x 4.5 | 13 x 4 |
| 18 x 6.5 | 16 x 5 | 15 x 4.5 | 13 x 4 |

TABLE NO. 6

| Pass No. | Roll Stand No. | Final Shape & Dimensions |
|---|---|---|
| | Ingot passes to intermediate rolls at 18 mm. square | |
| 1. | 1. | 29 x 11 mm. oval |
| 2. | 2. | 14 mm. square |
| 3. | 1. | 20 x 8 mm. oval |
| 4. | 2. | 10 mm. square |
| 5. | 3. | 18 x 6.5 mm. oval |
| 6. | 4. | 10 mm. round finish. |

On the spots where the scale appears, a small fissure is formed which during the testing for tensile bending and torsion, becomes deeper and results in an early breaking of the wire, thereby producing failures before the limiting values are reached.

✦ ✦ ✦

## The Hot Rolling

THE cast ingots are first hot rolled similar to copper ingots, before they are cold drawn. A hot rolling of this nature consists of a furnace for heating the ingots near which is located the roughing rolls usually three high, and a set of higher speed finishing rolls. The latter usually consists of four sets of double rolls. The heating temperature of the ingots should reach 650 to 700°C. Any type of furnace which uses an oxidizing atmosphere is usable, however in the interest of maintaining continuous operations, that type of furnace which automatically expels the ingots, is preferable. Special care must be taken to see that the heating of the ingots is uniform, in other words, the center of the ingot should be just as hot as the surface.

THE grooving of the roughing rolls is best accomplished with a fillet at the bottom of the groove, the best angle being 96°. The speed of the three high roughing rolls should be between 150 and 170 revolutions per minute. In Fig. 4 (see page 391) is given an example of the grooving of the roughing rolls.

✦ ✦ ✦

THE effective length of the rolls is 1170 mm. (about 46 inches). The diameter of the top roll is 350 mm., the middle roll is 345 mm., and the bottom roll 340 mm. The sequence of the grooves in the rolls, is as shown in Table 1.

TABLE NO. 1

| Designation for AC | EF in mm. | KG in mm. |
|---|---|---|
| 90 square | 134.5 | 120.5 |
| 81 " | 121. | 108.5 |
| 71 " | 106. | 95. |
| 63 " | 94. | 84. |
| 55 " | 82. | 37. |
| 48 " | 71. | 64. |
| 42 " | 62.5 | 56. |
| oval | 70. | 25. |
| 36 square | 54. | 48. |
| 33 " | 49. | 44. |
| 31 " | 46. | 40.5 |
| oval | 50. | 17. |
| 16 square | 24. | 21.5 |
| 18 " | 27. | 24. |
| 28 " | 24. | 37.5 |

THE spacing between individual grooves is 10 mm. until we come to the oval 70x25. From then on the spacing is from 5 to 4 mm. The adjusting screws (at the roll housings) are to be adjusted so as to give a space between the rolls of 5 mm.

✦ ✦ ✦

THESE roughing rolls are not only to be used on bronze telephone wires, but are just as adaptable to the rolling of copper or aluminum. The intermediate rolls (which will be described later) are also adaptable for copper or aluminum. The heated ingots receive the passes through the three high roughing rolls as shown in Table No. 2.

✦ ✦ ✦

WITH this last square pass, the rod leaves the roughing rolls and arrives at the intermediate or higher speed rolls. As already described, these consist of four stands of double rolls which have a speed of approximately 250 revolutions per minute.

**THE first stand** has an equivalent roll length of 950 mm., the top roll having a diameter of 250 mm., while the bottom roll is 245 mm. in diameter. On this stand all the grooves are oval in section. They are as shown in Table No. 3.

✦ ✦ ✦

THE most important and most frequently used grooves, are provided in twos, instead of singles, so that the rolls do not have to be regrooved after only one groove has been worn out. The space between rolls is 2 mm. Fig. 5 shows an example of the construction of such grooving.

✦ ✦ ✦

**THE second stand** has an equivalent roll length of 730 mm., the top roll having a diameter of 255 mm., and the bottom roll 250 mm. This stand contains only round and four cornered grooves in the sequence, as shown in Table No. 4.

✦ ✦ ✦

**THE third stand,** has an equivalent roll length of 600 mm., the top roll having a diameter of 260 mm., while the bottom roll is 255 mm. These rolls only contain oval shaped grooves in the order or sequence as shown in Table No. 5. (Also see Fig. 7).

✦ ✦ ✦

**THE fourth stand** has an equivalent roll length of 600 mm., the top roll having a diameter of 265 mm. and the bottom roll 260 mm. On these rolls there are only the finished round size grooves as follows; round diameters of 16, 15, 14, 13, 12, 11, 10 mm. (ten each); 8 mm. (ten each); 7 and 6 mm. (wo each); 5 mm. (see Fig. 8).

✦ ✦ ✦

THE ingot which leaves the roughing rolls in an 18 mm. square section receives the passes in the intermediate rolls as shown in Table No. 6.

✦ ✦ ✦

BOTH in the roughing, as well as the intermediate rolls, it is necessary to turn the rod 90 degrees before making the next pass,

(*Please turn to page 396*)

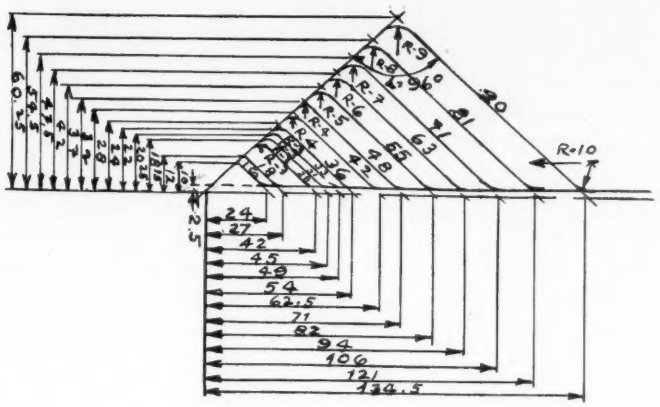



FIG. 4

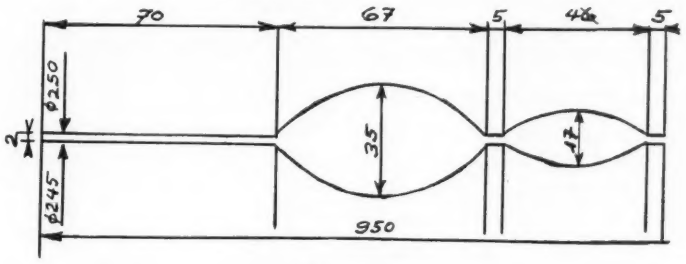



FIG 5

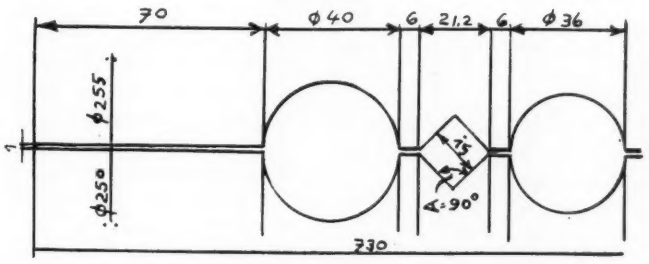



FIG 6

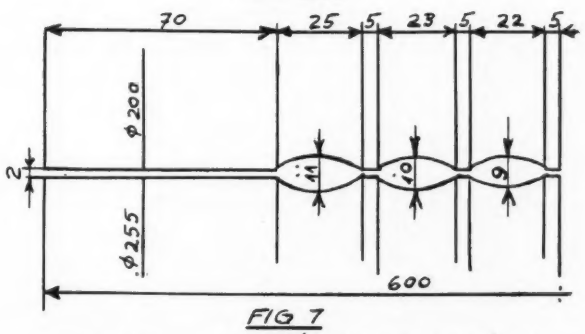



FIG 7

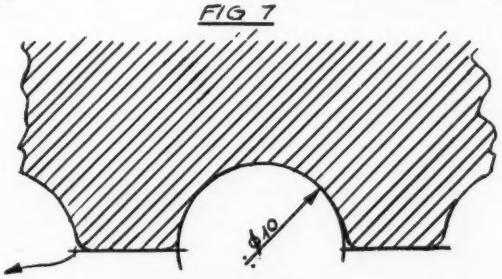



FIG 8

# 'Round the World With the Wire Industry

### IWECO Organized to Handle Rejected Wire Shipments

THE IWECO has appointed a committee for the purpose of forming a company which will act as an independent seller of refused wire shipments sent overseas. A number of trustees would take charge of such shipments and sell them in whole or in part. A number of export merchants are interested in this scheme and it is possible that such an organization will be established.

✦ ✦ ✦

### German Export Business Stimulated by Price Increase

THE increase of prices by 2 to 3 shillings per ton announced by the IWECO for all wire products has already had a stimulating effect on business. Orders from overseas, particularly Latin America are satisfactory. Latin America is in sore need of wire and therefore buyers are paying in pesos (and respectively, the other Latin American currencies) agreeing to bear the exchange risk, if the exchange should go against the buyers when the shipment arrives and further agreeing to pay the London rate of exchange and not the official rate. Business in dollars and francs is not permitted by the government, except for small parcels, but the taking over of the exchange risks by the buyers is making business possible for big quantities and fair orders have been booked for wire netting barbed wire and galvanized round wires.

✦ ✦ ✦

### Novel Method of Packing Wire Nails for Export

AS a novelty on the export market it is noted with interest, that certain markets are starting to buy wire nails in steel drums of cylindrical shape, base size 15", 18" and 20". These steel drums are not returned empty but filled with local products for re-shipment. For example, wire nails are shipped to New Zealand, Australia, etc., in steel drums which are returned filled with honey, feathers and apples. This is resulting in considerable saving in packing costs which amount to about 15% for wire nails and it is probable that other markets will adopt this method of packing. Great Britain has already adopted this method for export shipments of nails.

✦ ✦ ✦

### British Compete with Germans for Wire Rod Exports

IN the wire rod export market British competition is felt very keenly, and would be still more serious if the British industry produced Thomas steel wire. The competition therefore is restricted to o. h. steel wire rods which are not selling on the export markets in very great quantities. The British price for o. h. wire rod is so low that it is attractive not only to the British Empire but to Scandinavia, Germany and France as well. The continental wire rod cartel is therefore contemplating a reduction of prices on o. h. steel wire probably of 6-8 shillings per ton.

✦ ✦ ✦

### German Exports of Netting Stakes Increase

THE German industry reports that in the export market a rather fair demand has been noted for netting stakes. These are pressed from steel sheets (and are not tubes with holes, as usually supplied.) They are also used for wire fencing.

✦ ✦ ✦

THESE stakes have two to ten tongues cut in the back, the bottom tongue being open downwards and the others upwards. They are six to ten inches long. The demand is especially promising in Uruguay, the Argentine Republic, Ireland, South Africa and the Near East. The price is 11-11.15 per ton f.o.b. One dozen of these stakes are bundled together, and due to their open U shape which makes it possible to put one stake into another, they require little space, thereby making the freight rates very low.

✦ ✦ ✦

THEY are a new product, also made in Great Britain, and it is anticipated that a very fair and steady demand will gradually develop.

✦ ✦ ✦

### United States Best Customer of German Wire Industry

During the first half of this year Germany exported only 144,984 tons of wire products as compared with 224,467 tons during the first half of last year, and the value was only 32.8 Million Marks as compared with 52.335 last year. The highest value for a half year was reached in 1929 with 87.2 Million Marks. Only two markets bought more wire this year than the preceding; United States and Russia. All other markets purchased much less. The following is a comparison of amounts of wire bought by the United States during the first half of 1931 and the first half of 1932:

| | 1932 | 1931 |
|---|---|---|
| Wire rods | 145 | 102 |
| Bright wire (also galvanized) | 586 | 516 |
| Wire ropes | 789 | 719 |
| Barbed wire | 6.262 | 3.372 |
| Wire netting and wire mesh | 2.431 | 1.969 |
| wire nails and tacks | 5.055 | 4.226 |

✦ ✦ ✦

THE United States is now the best customer of the German industry, whereas last year both Great Britain and the Netherlands led. The loss of the British market is felt very seriously. The German industry hopes to be able to maintain the business with the United States.

✦ ✦ ✦

### Improved Process of Recovery of Beryllium

A PRACTICAL device for the recovery of beryllium at a considerably reduced cost, permitting a more extensive use of the metal as an alloy, has been developed after extensive experiments lasting three years by the German Beryllium Research Society. The addition of 3 per cent beryllium to copper alloys or bronze is said to give a tensile

# 'Round the World With the Wire Industry

strength equal to about 150 kilograms (328 lbs.) per square millimeter.

✦ ✦ ✦

THIS strength, combined with the flexibility and light weight, especially suits beryllium-bronze alloys for shaft cables and heavy wires of unusual length. These alloys offer strong resistance to water and air also. The production costs of beryllium remain high, preventing wide industrial application, although great progress is reported toward lowering these costs. Increased applications of beryllium are thought to be feasible, however, if the progress made so far toward lowering the cost can be continued. In this event the metal is sure to find a wider scope of usefulness in the wire industry.

✦ ✦ ✦

### Continental Wire Cartel Maintains Present Prices

THE Continental Wire Rod Cartel has met again this month, but has again decided to leave prices unaltered. Great Britain has entered the international markets as a new competitor and is selling large quantities of wire rods for export. The British wire rod products rose this year from 17,900 tons monthly average in 1931 to 28,000-30,000 tons in the last few months. Germany imported 1,470 tons from Great Britain in the first half of this year which is eleven times more than last year.

✦ ✦ ✦

### Longest and Heaviest Wire Rope

IN the September issue of WIRE AND WIRE PRODUCTS it was reported that the Sheffield Wire Rope Company, of Darnall, made a rope 11½ miles long in one continuous piece, but the Felten & Guilleaume Company of Koln, now claim to have made the longest and heaviest rope in the world, i. e. 100 K. M. long, weighing nearly 300 tons. This is being used for hauling ships by the Rhine Hauling Company.

### German Wire Cartel Reports

THE German Wire Cartel reports that the allotments for the first seven months of this year as filled by the members were 38% domestic, and 53% foreign. This decline is almost half as compared with last year.

✦ ✦ ✦

### Export Prices for Wood Screws Decline

THE price decline on the export market for wood screws of brass is without a parallel. The decline for iron wood screws is not as serious. The negotiations concerning establishment of an International Wood Screw Cartel have not yet progressed. The Belgian and Swedish industries are against it.

✦ ✦ ✦

### The Wire Nail Industry in China

THERE are now ten big and small wire nail factories in Shanghai, China, amongst which the Kung Chin Iron Works Company, Ltd., is pioneer. This large plant has been operated since 1920, despite the Civil wars in China, insufficient managing experience and the lack of financial support in this new industry. Under the revised tariff on wire nails imported since the beginning of 1931, this company has been rapidly increasing its production to the amount of 700 tons per month.

✦ ✦ ✦

THE two other large factories are operating under British and American registrations, respectively. Both of these plants can produce 1,000 tons per month at full capacity, while the other seven small factories are capable of manufacturing 700 to 1,000 tons per month in all. Therefore, the total production of wire nails in Shanghai only, would be 50,000 kegs (100 lb. kegs) per month approximately.

THERE are two other nail works in Tientsin, one small factory in Amoy, and others are soon expecting to be established in Canton and Hankow. Materials are mainly imported from Germany and Belgium. Unfortunately, after the Japanese hostilities against China, and the general depression of the market, nail factories in China are only operating from 30% to 70% capacity at present.

✦ ✦ ✦

### Stainless Steel Tested for Shipping Purposes

THERE has just been inaugurated by a Sheffield firm what is claimed to be the most complete test ever made of stainless steel for shipping purposes. It has been arranged by S. B. Attenborough, who for some time past has been a director of Stainless Steel Goods, Ltd., an enterprise having the object of promoting the use of stainless steel for purposes other than cutlery. The test, which has been approved by one of the leading steel companies specializing in stainless steel and by the marine superintendent of a famous shipping company, is being carried out on a large vessel which is now on its way to Australia.

✦ ✦ ✦

OVER 70 samples are being tested, including nails, bolts, nuts, wire, wire netting and other wire goods used at sea, steel plates, sheets, etc. It is hoped to ascertain definitely whether other conditions which must inevitably arise, apart from the action of the sea and the weather, will cause any serious difficulty or failure. The results of this test will be awaited with immense interest by the trade.

✦ ✦ ✦

### British Raise Import Duties

BY an order which came into force on September 6 additional import duties were imposed by the British Treasury on a

(*Please turn to page 397*)

# Exports and Imports of Wire

**Exports of iron and steel wire products in June and July, 1932**
(In gross tons)

| | July 1932 | June 1932 | July 1931 |
|---|---|---|---|
| Wire rods | 111 | 693 | 1,708 |
| Hoops, bands, and strip steel | 1,598 | 883 | 1,610 |
| Plain black or galvanized iron or steel wire | 491 | 468 | 1,049 |
| Barbed-wire and woven wire fencing | 1,313 | 1,384 | 2,169 |
| Woven wire screen cloth | 76 | 51 | 117 |
| Wire rope | 170 | 67 | 178 |
| Insulated iron or steel wire and cable | 5 | 3 | 33 |
| Other wire and manufactures | 187 | 182 | 320 |
| Wire nails | 1,153 | 483 | 943 |
| Tacks | 34 | 34 | 70 |
| Other nails, including staples | 185 | 251 | 298 |
| Bolts, machine screws, nuts, rivets and washers | 297 | 193 | 437 |
| Total, these 12 classifications | 5,620 | 4,692 | 8,932 |

**Imports of iron and steel wire and wire products into the United States**
(In gross tons)

| | | | |
|---|---|---|---|
| Concrete reinforcement and other bars | 4,024 | 6,645 | 7,534 |
| Wire rods | 267 | 457 | 687 |
| Barbed wire | 1,254 | 1,759 | 1,492 |
| Round iron and steel wire | 156 | 199 | 244 |
| Telephone and telegraph wire | 3 | | 5 |
| Flat wire and strip steel | 567 | 56 | 91 |
| Wire rope and strand | 70 | 197 | 69 |
| Other wire | 157 | 86 | 48 |
| Hoops and bands | 4,188 | 2,382 | 1,867 |
| Nails, tacks and staples | 1,043 | 998 | 1,091 |
| Bolts, nuts and rivets | 17 | 16 | 138 |
| Total, these 11 classifications | 11,746 | 12,795 | 13,266 |

AT 18,005 gross tons, United States imports of iron and steel products in July were at the lowest level of any month since March, 1922, and were 16,489 tons, or 47.8 per cent, smaller than the June trade of 34,494 tons. Two unusual features marked the month's trade, the precipitous decline in imports of pig iron and the rise of hoops and bands to the ranking position in the trade on a tonnage basis. In all, 16 classes of material were imported in smaller quantities in July than in June, 17 classes showed increases, and 1 no trade in either month or in the first seven months of the year.

✦ ✦ ✦

REFLECTING the sharp decline noted above, the cumulative total of iron and steel imports over the period from January through July—227,011 tons—was 43,121 tons, or 16 per cent, smaller than that of the corresponding period of 1931. At the end of the first six months the cumulative total was only 10 per cent less in 1932 than in 1931.

✦ ✦ ✦

THE only noteworthy increase recorded in the July trade was that in hoops and bands, imports of which were larger by 1,806 tons than they had been in June. On the other hand, there were several instances of decreased receipts which were outstanding, this list being led by the 13,931 ton decline in the trade in pig iron. Other decreases of moment were those in ferromanganese, 1,890 tons; concrete reinforcement bars, 1,401 tons; and merchant steel bars, 1,268 tons. In point of tonnage, hoops and bands led all other products in the July trade, with a total of 4,188 tons received. This was followed in order by concrete reinforcement bars, structural shapes, merchant steel bars, and duty-free barbed wire.

✦ ✦ ✦

BY a narrow margin Belgium led the other supplying nations in the July trade, its 5,690 ton total, including 1,588 tons of concrete reinforcement bars, 1,088 tons of merchant steel bars, 1,044 tons of structural shapes, and 968 tons of hoops and bands. Germany took second place with a total of 5,439 tons, of which 1,236 tons was barbed wire, 1,100 tons was hoops and bands, and 1,011 tons nails, tacks, and staples. The French total of 2,435 tons included 709 tons of hoops and bands, 522 tons of structural shapes, and 491 tons of flat wire and strip steel, while 1,411 tons of the British total of 2,115 tons was hoops and bands. Only 779 tons was imported from Canada in July, 490 tons being ferromanganese, and 103 tons wire rods.

✦ ✦ ✦

RECEIPTS of card clothing rose to 5.488 square feet and were valued at $6,169-5,333 square feet ($5,544) coming from the United Kingdom.

Wire cloth and screening imports were less than half as large in July, at 12,036 square feet, than they had been in June, with imports coming from Germany (5,300 square feet), France (3,570 square feet) and Canada (3,166 square feet).

✦ ✦ ✦

FOURDRINIER wire receipts—57.311 square feet—were considerably smaller than in June, 26,577 square feet originating in Austria, 18,116 square feet in Germany, 7,689 square feet in Sweden, 4,189 square feet in France, and the rest in Czechoslovakia.

✦ ✦ ✦

WIRE fencing and netting imports increased in July, that galvanized before weaving gaining to 4,574,901 square feet (3,736,655 square feet from Germany, 808,750 square feet from the Netherlands, and the rest from Belgium), with that galvanized after weaving totaling 5,263,690 square feet (3,721,255 square feet from the Netherlands, 1,245,165 square feet from Germany and the rest from Belgium).

✦ ✦ ✦

WIRE heddle imports at 110,000 pieces were less than half as great as in June, the entire quantity coming from France.

✦ ✦ ✦

DR. LOEWE of Berlin has produced a photometric apparatus through which any length of wire can be run, and a circle of light is thrown on to a scale which indicates to within 1/500th part of a millimetre, the diameter of the wire then passing through the machine.

# A Review of Recent Wire Patents

No. 1,869,354, ROD BUNDLE TRANSFER MECHANISMS, Patented August 2, 1932 by Bruce N. Bletso of Cleveland Heights, and Walter V. Magee of Lakewood, Ohio.

This invention is characterized by having a rod bundle receiving device arranged for swinging movement from one endless rod bundle conveyor to another and a second rod bundle engaging device arranged for swinging movement aligned with the movement of the first named device, so that by imparting swing motion to each of these devices a rod bundle may be carried from one conveyor to another and deposited on the second conveyor by swinging the bundle engaging device beyond the first device.

✦ ✦ ✦

No. 1,870,306, CATHODE FOR ELECTRON DISCHARGE DEVICES, Patented August 9, 1932 by Emil Gideon Widell of Bloomfield, New Jersey, assignor to Westinghouse Lamp Company, a Corporation of Pennsylvania.

In accordance with this invention, a cathode is provided having a metal core of small cross section and consequently small current consumption and this is coated with an extremely heavy layer of non-metallic refractory material of poor heat conductivity but high electron emissivity. Such a material may consist of a mixture of the oxides of the alkaline earth metal such as barium and strontium or a mixture of these oxides with other refractory oxides such as magnesia and alumina. The metal core referred to is a small platinum or platinum-iridium wire.

✦ ✦ ✦

No. 1,870,713, WIRE COIL AND METHOD OF MAKING SAME, Patented August 9, 1932 by Hendrik de Jong of Eindhoven, Netherlands, assignor to Radio Corporation of America, a Corporation of Delaware.

More particularly this invention relates to electrical coils wherein insulating strips are inserted between adjacent layers to produce transformer coils. The method comprises beveling at least one of the ends of each of the insulation strips before they are wound and feeding the strip so that the sharp point of the beveled end is adjacent the side of the bobbin where the strip is gripped by the winding wire.

✦ ✦ ✦

No. 1,870,990, INSULATION OF WIRE, Patented August 9, 1932 by Ralph Russell Evans of Watertown, Massachusetts, assignor to Simplex Wire and Cable Company of Boston, Massachusetts, a Corporation of Massachusetts.

The invention relates particularly to the application of liquid dispersions of insulating materials to wire, the method comprising passing the wire, still unwetted by the liquid dispersion, upwardly through an aperture somewhat larger than the wire in a die and then through a mechanically undisturbed pool of the liquid dispersion maintained on the upper face of the die, without permitting the wire to contact with the die, and causing the liquid dispersion flowing downwardly through the aperture to be carried away from the approaching unwetted wire below the die.

**Complete Descriptions and Drawings of Patents May Be Had for 25 cents. Address, Wire & Wire Products, 17 East 42nd St., New York.**

✦ ✦ ✦

No. 1,871,970, ARMATURE WINDING MACHINE, Patented August 16, 1932 by Rodger J. Emmert of Anderson, Indiana, assignor by mesne assignments to Delco-Remy Corporation of Dayton, Ohio, a Corporation of Delaware.

One of the objects of the present invention is to provide for automatically moving or indexing the armature core into the succeeding winding position in response to the stopping of the machine after a certain number of turns have been wound upon the armature core. A device is provided around which the wire is looped before the winding operation is performed, the device moving into a position for releasing the loop in response to the stopping of the machine after a coil winding operation has been performed.

✦ ✦ ✦

Reissue, 18,576, METHOD OF AND APPARATUS FOR MAKING COILS, Patented August 23, 1932 by Reginald F. Sedgley, of Philadelphia, Pennsylvania.

The method of making coils, as disclosed in this patent, consists in continuously feeding a strip of material and during such feed subjecting it to a forming operation to vary its form in cross section, then to a coiling operation, and mechanically cutting off predetermined lengths of the coils in timed relation with the forming and coiling operations, the cutting off operation being conducted after the predetermined lengths of coils have been fed into cartons.

✦ ✦ ✦

No. 1,872,818, IMPREGNATED PAPER INSULATED, LEAD COVERED CABLE, Patented August 23, 1932 by Denney W. Roper of Chicago, Ill.

The object of the invention is to eliminate the residual air in the ordinary type of insulation in connection with lead covered wire cable, so as to eliminate the deterioration due to ionization, and yet to provide a cushion of gas which is effective to prevent stretching of the lead sheath under load conditions and enable the ordinary type of insulation to be operated at stresses and temperatures approximating those now employed in oil-filled insulation. This is accomplished by modifying the evacuation and impregnation process so that all of the residual gas (nitrogen) within the insulation will be inert and harmless.

No. 1,873,422, WIRE UNREELING AND TENSIONING DEVICE, Patented August 23, 1932 by Clarence J. Keller of Anderson, Indiana, assignor to Delco-Remy Corporation of Anderson, Indiana, a Corporation of Delaware.

One of the objects of this invention is to provide certain improvements whereby unreeling and wire tensioning devices of the type disclosed will be rendered more sensible to variations in the force applied by the wire-consuming machine to pull the wire from the supply reel, and the patentee refers to U. S. Patent 1,834,993 as disclosing an unreeling and wire tensioning apparatus to which the improvements are applicable.

✦ ✦ ✦

No. 1,873,461, WIRE KNOTTING MACHINE, Patented August 23, 1932 by Michel Nigro and Arthur C. Nigro of Worcester, Massachusetts, assignors to Sleeper & Hartley, Inc., of Worcester, Massachusetts, a Corporation of Massachusetts.

Particularly, this invention is adapted for use with a machine for knotting or tying the free end of a coiled spring, the machine presenting the spring to the knot tying or twisting tool in such a manner that it is properly positioned and firmly held in advance of the knotting operation, thereby making it possible for the operator's hand to be some distance away from the machinery and not apt to be drawn into the moving parts.

✦ ✦ ✦

No. 1,873,470, CABLE ARMOR, Patented August 23, 1932 by Robert L. Peek, Jr., of Elizabeth and Claude L. Hippensteel of Bloomfield, New Jersey, assignors to Bell Telephone Laboratories, Incorporated, of New York, N. Y., a Corporation of New York.

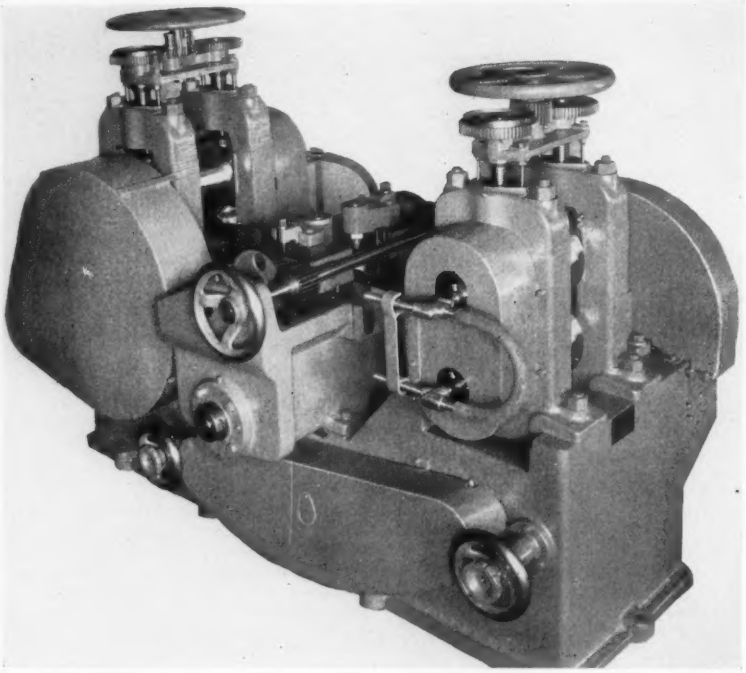
This cable has a sheathing of like metal constituted by age-hardened alloys of aluminum with other alloying elements selected from the group comprising copper, silicon, manganese and magnesium and in which the light sheathing wires are covered with a coating of purified aluminum. Because the more conductive material is on the outer surface, the equivalent conductivity, owing to the skin effect, will be greater for currents of relatively high frequency than a uniform solid conductor of the same direct current conductivity.

✦ ✦ ✦

No. 1.874.722. ELECTRICAL COIL AND PROCESS FOR MAKING THE SAME, Patented August 30, 1932 by Harry W. Turner of Schenectady, New York, assignor to General Electric Company, a Corporation of New York.

The coil comprises a core and enamel conductors wound in layers on the core, the conductors being separated between layers by films of cellulose acetate tightly shrunk around the conductors, the entire core being impregnated and coated with a resin of the alkyd type.

# Flat Wire Rolling Mill



**10″ Breakdown—5″ Edging—8″ Finishing Rolls Driven by 40/50 h. p. 3 to 1 Variable Speed Motor. Capacity 150 to 450 ft. per minute. Wire Straightening rolls, scarfing attachment, guides between rolls and Take-up strand to suit customer's needs.**

WE BUILD

Rod Blocks—Inverted Type

Chain Draw Benches—Multiple Coil Winders.

Flat Wire Rolling Mills—Rod Pointers.

Hollow Wire Straighteners and Equipment.

Multiple Strand Bright Annealing Units.

Stranders to Customers' Specifications.

Reelers and Spoolers for all sizes of Wire and Cable.

Reelers and Spoolers for Tinning, Galvanizing, Patenting and Annealing.

Designer and Builder of Special Machinery

**Frederick M. Conran**

Designer of Special Machinery for Rod, Wire, Tube, Strip and Cable.

107 Colden Street Newark, N. J.


## Special Bronze for Telephone and Telegraph Conductors

(*Continued from page 391*)

so that the large dimension assumes the vertical position in each rolling operation. It is highly recommended that when rolling bronze in the intermediate rolls, that instead of looping the starting end of one pass into the next one, thereby having the condition where one rod is running through two or three passes simultaneously, that the entire rod pass through one groove before it is permitted to enter the next one. The reason for the foregoing, is that in the case of looped passes, the mechanical working with the rods makes the heating of the latter cumulative. This must be avoided in the case of bronze. In order to obtain the desired tensile strength on the completed product, it is highly important that during each pass, the rod should be at a colder temperature, than in the preceding pass. For example, before passing the 18x6.5 oval shape into the 10 mm. finishing round groove, the rod is allowed to lie on the mill floor until it has cooled sufficiently that, when a piece of white paper is pressed to the rod, the paper will not turn brown. When the rod has met that condition, only then, is it put through the finishing pass and while going through this groove, it must ring like steel. Should we be careless and roll the last pass at two high a rod temperature, the wire produced from this rod will not possess the necessary tensile strength.

✦ ✦ ✦

The Third Installment of This Article Outlining Hot Rolling Practices, Rod Mill Operations and Wire Drawing Will Be Published in The January Issue

(*Continued from page 393*)

number of commodities on the recommendation of the Import Duties' Advisory Committee. On screws for wood made wholly of iron or steel, or of iron or steel coated or plated with some other metal or substance, the duties have been increased in the case of screws up to and including 8-gauge to an aggregate of 3d. (6 cents) per lb., or 1½d. (3 cents) per gross, whichever is the greater, and in the case of those over 8-gauge to an aggregate of 2d. (4 cents) per lb. The duties on screws for wood made of brass, copper, or any alloy containing copper, whether coated with some other substance or not, are increased in the case of those up to and including 8 gauge to an aggregate of 9d. (18 cents) per lb., or 2½d. (5 cents) per gross, whichever is the greater, and in the case of those over 8-gauge to an aggregate of 6d. (12 cents) per lb.

✦ ✦ ✦

SCREW hooks, screw rings, and screw knobs are not subject to these increases.

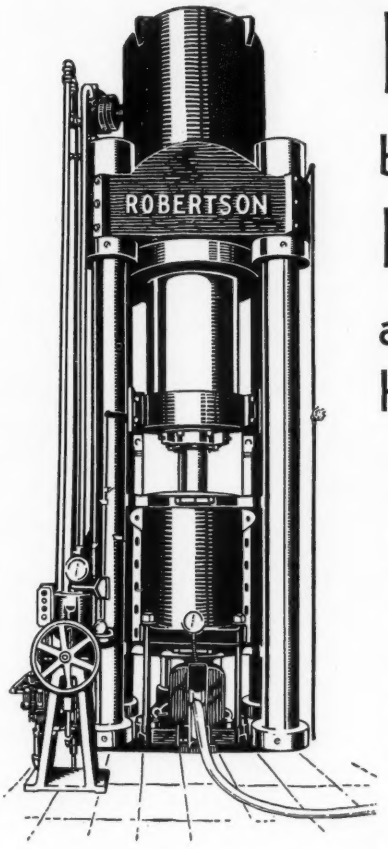
✦ ✦ ✦

THE Committee reports that the production in the United Kingdom of metal screws for use in woodwork is in the hands of an associated group of companies. British production in 1931 was approximately 16,000,000 gross, of which roughly 3,000,000 gross were exported. Before that the distribution of the world trade was regulated by an international agreement. This agreement was terminated at the end of 1931 and the competition of foreign manufacturers has been greatly intensified. Secure in their domestic markets under tariff protection, foreign manufacturers have been able to quote very low prices in Britain. The Committee is satisfied that, in the circumstances now obtaining, it is in the interests of Britain to give more protection to domestic manufacturers.

✦ ✦ ✦

THE Committee recognizes the objections which may be raised to the grant of a relatively high degree of protection to an industry


# LEAD ENCASING PRESSES by Robertson are widely used here and abroad




**Robertson lead-encasing presses are used for extruding lead sheath directly on to electrical wires and cables, from ¼" to 5" outside diameter, and also for lead-encasing bare metal wires, rods, and tubes. They are built for hydraulic capacities from 650 to 2500 tons, — and they are used exclusively in many plants here and abroad. In fact, they're practically "a standard."**

ROBERTSON equipment includes: Extrusion Presses, Hydraulic Pumps, Melting Furnaces, Pots, Dies and Cores, Strippers, etc. The Robertson Hydraulic Pump is slightly higher in first cost, but maintenance and upkeep are lowered so materially that a large saving results in the end. WRITE FOR LATEST ROBERTSON BULLETIN. Use coupon.

John ROBERTSON CO. INC. Pioneers-Since 1858

125-137 Water Street Brooklyn, N. Y.

John Robertson Co., Inc., 125-137 Water St., Brooklyn, N. Y.
Please send me Literature and Details regarding—
( ) Wire & Cable Encasing Presses ( ) Sheath Strippers
( ) Hydro-Pneumatic Accumulators ( ) High Pressure Pumps
Mr. ..... Title .....
Firm .....
Address .....

# DRINOX

for

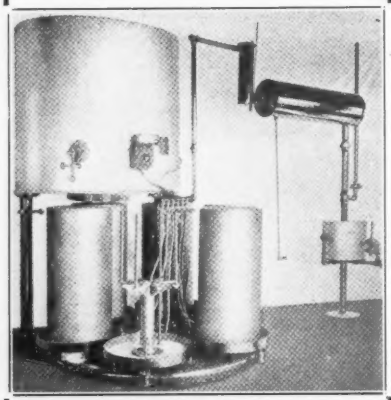
**dry bright annealing ferrous and non-ferrous metals**

✦ ✦ ✦

**and for metals which should be kept dry during the cooling period such as**

**FINE WIRE, SPOOLED OR COILED, HOLLOW WARE, SHELLS, ETC.**

✦ ✦ ✦



**The annealing operation is entirely dry and eliminates stains and stickiness.**

✦ ✦ ✦

**Metal annealed by this method compares favorably with strand annealing at a fraction of the cost.**

✦ ✦ ✦

**The operation is simple and ample time is afforded by the multiple charging magazines, for proper heating and cooling.**

✦ ✦ ✦

**Accurate temperature control, from thermo-couples located in the charge, enable the operator to anneal with maximum precision.**

✦ ✦ ✦

**Requires no foundation, is self-contained and may be located in the line of production.**

✦ ✦ ✦

**A skilled engineer will gladly advise you regarding your annealing problems upon request.**

✦ ✦ ✦

CHAS. F. KENWORTHY, Inc.

**Industrial Furnaces**

**WATERBURY, CONN.**


which is under unified control, and it proposes to watch the interests of the domestic consumer. It is assured by the manufacturers that the increased duties will enable them to make a substantial reduction in domestic prices.

✦ ✦ ✦

### Britain's Largest Telephone Cable

WORK in connection with the laying of the largest trunk telephone cable ever put down in the United Kingdom is at present proceeding apace in Sheffield. The work is being carried out by British Insulated Cables, Ltd., of Prescot. This firm started laying the great cable in Leeds last April and expects to reach Derby in about three months' time, when it will have laid approximately 75 miles of cable between these two centers.

✦ ✦ ✦

WHEN the job is completed the British Post Office Telephone Service will have the use of a cable which will be more than adequate to cope with all the business along the route, with ample provision for expansion of the use of telephones during years to come.

✦ ✦ ✦

### Well-known British Steel Wire Firm Shows Big Loss

A FURTHER loss is reported as a result of the past year's operations by Wright, Bindley & Gell, well-known British steel wire and umbrella frame manufacturing concern. The net loss amounts to £1,425 ($7,125), as compared with £2,238 ($11,190) for 1930-31. However, the company's investments have appreciated, and as a result reserves previously set aside to meet depreciation are no longer required and have been transferred to profit and loss account. There is thus a credit balance of £2,198 ($10,990) to go forward. It view of the continued depression, the directors do not recommend the payment of any dividend on the preferred or ordinary stock.

✦ ✦ ✦

### Commentary on Present European Conditions

MR. PERCY R. CLARK, Managing Director of the Societatea Anonima Anglia of Roumania, recently made a trip through Germany and England on which he comments in the letter following:

Dear Mr. Brown:

I have just returned from a visit to Germany and England. My visit was a rush one, as crisis conditions do not allow much time to wander around.

I found in both countries conditions were pretty bad—especially in Germany.

A sure sign of the crushing nature of the crisis can be seen from one simple fact that in the best business streets of Berlin, e. g. Unter den Linden, Friedrichstrasse, etc., about one shop in four bears the sign "zu vermieten" (to let).

To return more to our particular branch of industry, Dr. Loewe, of Berlin, showed me a very interesting machine he has produced—a photometric apparatus through which can be run any length of wire, and a circle of light is thrown on to a scale which indicates to within one 500th part of a milli-


**The Discussions at the Wire Association Meetings Will Not Be Published In**

**WIRE AND WIRE PRODUCTS**

▲ ▲ ▲

STENOGRAPHIC COPIES OF ALL DISCUSSIONS ARE OBTAINABLE AT $2.50 FROM

**THE WIRE ASSOCIATION**

17 East 42nd street — New York, N. Y.

metre the diameter of the wire then passing through the machine.

One of the largest wire rope manufacturers in Britain told me he was only working at 40% of his pre-crisis output.

The rope wire business is particularly slack; certain of the larger wire drawers also make strip and are picking up a bit of that line.

Of course all the large industrial concerns of Europe are suffering from the exchange restriction now instituted in so many States of Central and Eastern Europe — naturally manufacturers are no longer willing to ship goods to countries where such restrictions exist, for the obtaining of foreign currency calls for a lot of influence and energy, the buyer therefore in such a restricted country has a very comfortable excuse not to liquidate his foreign indebtedness.

With kindest regards, believe me,

Very truly yours,
Percy R. Clark.

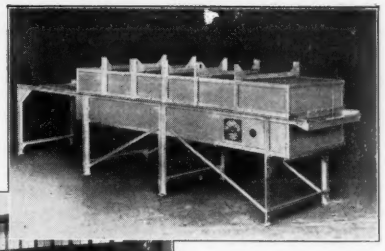
THIS is a very interesting commentary on European industrial conditions of the present time.

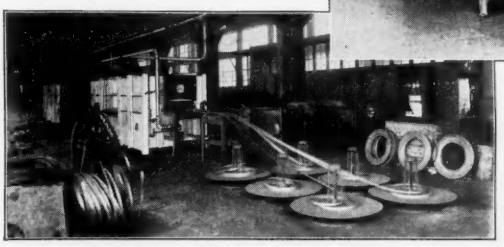
✦ ✦ ✦

### Spring Design

A THOROUGHLY comprehensive treatise on springs, wire forms and spring wires including much heretofore unpublished data has been published as a 48-page book entitled "Springs" by the Wickwire Spencer Steel Company, New York. A set of helical spring design tables including over 2000 combinations of wire and coil diameter are included by means of which a helical spring may be designed without solution of the more complicated formulas. Calculations include a formula by which definite factors may be applied and a commercial tensile strength found for any type of spring wire. The book, which is exceptionally well prepared both from a technical and appearance standpoint, is devoted primarily to engineering data, tables and formulas.


**ROCKWELL**
**FURNACES**
**ELECTRIC *and* FUEL**





FOR FERROUS and NON-FERROUS WIRE PRODUCTS

Complete heating equipment for strand annealing, billet heating and intermediate operations.

Bright annealing furnaces for ferrous and non-ferous metals.

Write for Catalog 323-339B.

"Furnaces to Suit Conditions"

Electricity---Gas---Oil---Coal

W. S. ROCKWELL COMPANY
Industrial Heating Equipment
50 ChurchSt., New York
(Hudson Terminal Building)

Detroit Chicago Columbus Cleveland Indianapolis Montreal Toronto

**FOR PROPER LUBRICATING SOAPS**
**FOR ALL CONDITIONS**
**GET IN TOUCH WITH**

**THE J. T. ROBERTSON CO., INC.**
SYRACUSE, N. Y.
*Wire drawing soap specialists since 1893.*

**STEELSKIN**
REG. U. S. PAT. OFFICE
For High or Low Carbon Wire
**WIRE DRAWING SOAPS**
Established 25 years.
R. H. MILLER CO., Inc. Homer, N. Y.

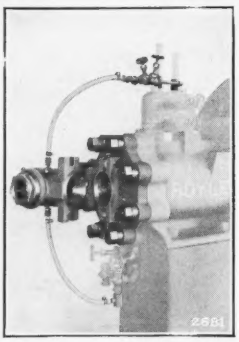
Machines for Coating Wire with Rubber, Plastic or Flux

▲ ▲ ▲

Your Inquiries Solicited

JOHN ROYLE & SONS

Straight & Essex Sts., Paterson, N. J.



Steam Heated Extruding Head (open) on Royle Tubing Machine



**Patents—Trade Marks**

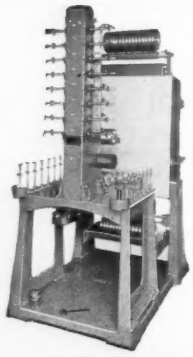
All cases submitted given personal attention by members of the firm. Information and booklet free.

**Lancaster, Allwine & Rommel**

PATENT LAW OFFICES

Suite 438, 815-15th St., N.W. Washington, D. C.



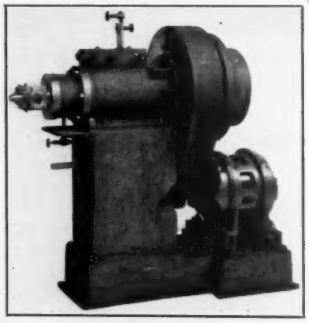


AIMCO R-16 MODEL
WIRE ENAMELING MACHINE

Enamels Wire 36 B. & S. Gauge and Finer.
Electrically Heated Oven with Thermostatic Control.
Finished Wire Spindles Individually Controlled.
Traverse is Adjustable for Different Spool Dimensions.
Low Cost of Enameling Wire is Due to Ease of Operation and Number of Spindles one Operator can tend.
Self-Contained on Bed-Plate.
Motor Driven.
Motor included.

EST. 1855 AIMCO INC. 1915
"American" INSULATING MACHINERY COMPANY
517 Huntingdon St.
PHILADELPHIA PENNSYLVANIA U.S.A.





Johnson Super Production Tubing Machine

Wire Insulation covered on the JOHNSON SUPER PRODUCTION TUBING MACHINE has uniformity of diameter; also, thin walls on small wires can be produced by this machine at exceedingly high speeds.

Write for bulletins and other information.

NEW ENGLAND BUTT CO.

Sole manufacturers under Johnson Patents up to and including 3¾" worm.

Dept. W-11

PROVIDENCE, R. I. CHICAGO, ILL.

U. S. A.


## Wire Association 1932 Convention

(*Continued from page 384*)

THE report of the Secretary and Treasurer was presented and discussed in detail. This will be sent to members of the Association in bulletin form. The extracts following are, however, of general interest.

### Membership

AT the directors meeting held in New York, on March 3d, 1932, it was brought out that the legal departments and counsel of certain firms feared a "contingent liability" through membership. The ensuing discussion brought out the fact that there also was a general misconception as to the ownership of the publication "WIRE & WIRE PRODUCTS" and that the same conditions exist as in the case of "Metal Progress" and other Association papers which are owned and subsidized by the Associations they represent. As a result of these discussions, the Secretary was directed by the directors to have attorneys recommend the corrections necessary to be made in the Constitution and By Laws to eliminate this uncertainty as well as all possibility of individual or company liability for members and contributors.

The Secretary thereupon consulted the attorney for the Association and as a result mailed out to all members of the Association certain changes and alterations in the By Laws which would effect the changes desired.

The recommended changes were approved by mail by over 80% of the members including the companies which had brought the question up and it is hoped that this action will result in considerable support for the Association.

✦ ✦ ✦

AT the present time (October 10, 1932) the Association has 182 members in good standing.

During the year there were 13 members lost; two through death and eleven through resignations. In the same period twenty-eight members joined the Association.

✦ ✦ ✦

### Mailing Work

DURING the period from the last meeting in June, 1931, we

handled 610 inquiries, including requests for technical data, sources of supply of wire, and information as to where to buy special types of machinery and equipment.

When it is considered that each inquiry entailed approximately 20 letters it will be seen that the ordinary operation of the Association required the handling of 12,200 pieces of mailing matter for this purpose alone.

For the Association meeting a general mailing was made of 3000 letters to the production men of the industry, as well as special mailings to selected lists.

In connection with the Industrial Procurement Planning Committee work, approximately 600 complete sets of questionnaires must be mailed out. Each one of these questionnaires is resulting in an average of three letters or approximately 1800 letters.

In addition, about 600 letters were sent regarding membership and miscellaneous subjects, making a total in round figures of 18,000 letters handled from the Secretary's office during the last year.

✦ ✦ ✦

SINCE the meeting many members of the Association have expressed their gratification at the frankness and openness with which the discussions were held and the really helpful information which was given.

**Mr. E. P. Kastein,** Purchasing Agent of the Keystone Steel & Wire Co., probably tells the story as concisely as it can be stated:

"As a result of the present tremendously competitive era and which without any question will follow this depression, the paramount problem of our Industry, like others, is to reduce our costs still further. I know of no better medium than the Wire Association. This was exemplified in the meetings which we attended last week by a very frank and unselfish discussion of many subjects and practices, and in my estimation it is this very coordination, one with the other, which will result in this Association's success. Our meetings surely afforded a clearing house for many ideas. . . . . .

"My further recommendation for next year would be that one entire afternoon be set aside for the visitation of some rather major, modern and representative wire mill where complete operations such as pickling, baking, annealing, patenting, quenching, drawing, fabricating, etc., can be witnessed.

"All who are responsible for the recent Wire Association program in Buffalo are to be congratulated for its success, and I wish to take this occasion to pledge our Company's further support.

"According to my analysis the meeting was a big success and I hope it may be my privilege to be present again next year."

✦ ✦ ✦

TO sum up, this meeting was a great advance over previous ones and the successful conduct has demonstrated the true value of its work to the industry.

✦ ✦ ✦

**The Thompson-Gibb Electric Welding Company,** with plants at Lynn, Massachusetts and Bay City, Michigan, announces a new department for the manufacture of a complete line of wire mill and stranding machinery. The new products will include wire drawing machinery, pointers, take-up frames, planetary, rigid type and high speed stranders for wire rope and electric cables; cable armoring and saturating equipment; steel, paper and rubberized taping machines and heads, and electric brazing machines.

Mr. A. R. Petterson, formerly with the American Steel & Wire Company, and also formerly chief engineer for the New England Wire Machinery Company, will have charge of the sales and engineering work.


BALLOFFET

The Quality Diamond Dies

1870 1932

**BALLOFFET DIAMOND WIRE DIES CO. INC.,**
**13-15 East 22nd Street, New York City**
**Factories in France: Lagnieu-Cluses-Trevoux**

**"NEP"**

**New Economic Pickling**

✦ ✦ ✦

**The only Soluble Inhibitor in Powdered Form on the Market**

**"NEPOWDER"**

**We know what the Wire Industry needs to properly Clean Metal and that is**

**"NEPOWDER"**

✦ ✦ ✦

**One pound controls 300# of Acid**

✦ ✦ ✦

**There is no other Inhibitor on the Market produces such a bright finish in Cleaning Rods and Wire.**

**THE Wm. M. Parkin Company**

**Chemical Engineers to the Steel Industry 20 Years.**

**PITTSBURGH, PA.**

**WIRE DRAWING MACHINERY AND EQUIPMENT**

**Rod Frames—16" Frames, 8" Frames —Take-Up Frames, Wire Pointers— Puller Tongs.**

**General Castings for Wire Mill use.**

**Circulars on Request.**

**E. J. Scudder Foundry & Machine Co.**
**TRENTON, N. J.**

VIANNEY
DIAMOND DIES
100 FIFTH AVE · NEW YORK

## Lead in Wires

(*Continued from page 381*)

nounced it will be detected at the factory with a loss of "shrinkage". The makers of this copper-clad wire are doing much to combat this evil and many are making a very fine product. Never-the-less as a safety measure, we have felt it desirable to set up a testing method to detect this occasional bad wire, which when it does occur, is extremely costly. For over a year we have been testing a portion of every strand of this wire which comes into our factory and in that time no instance of failure has been experienced. For this reason we believe it will be permanently successful and feel it will be possible for the industry as a whole to adapt similar measures to protect themselves and their customers. This quality phase is probably the least explored realm of the weld maker's art. I have seen welds being made slowly and tediously, by hand, and one at a time, because the manufacturer thought there was no product of certain enough quality available to him. There is a large firm in the middle west using a special purpose weld and making their own for this reason.

IN these days of stringent finance would it not be wise to consult more shrinkage reports and see how far quality does really pay? Welds sell for about one to four dollars a thousand and one bad weld can destroy about fifty times its value in a lamp, 100 times its value in a radio tube, and 1000 times its value in a photo-electric cell.

✦ ✦ ✦

## Riehle and Torrington Effect Manufacturing Arrangements

A MANUFACTURING agreement has been concluded between Riehle Bros. Testing Machine Company, of Philadelphia, and The Torrington Manufacturing Company whereby the machines and instruments of the former company will be built by The Torrington Manufacturing Company at its Plant in Torrington, Connecticut.

Riehle Bros. Testing Machine Company will retain its corporate identity and will continue to conduct its engineering and sales.

The arrangement assures the continuance of Riehle Bros. Testing Machine Company's many years of experience in the design of physical testing equipment and provides a superior machine building facility for its product at Torrington.

Riehle Bros. Testing Machine Company has been in business since 1825 and was the pioneer developer of physical testing equipment in this country.

The Torrington Manufacturing Company was organized in 1885. It specializes in the design and building of a great variety of machinery, largely of a special nature, used in strip, sheet, tube, rod, wire and cable mills. It has also a manufacturing department given over to the production of a large variety of press and screw machine products.

**W. H. Spowers, Jr.**
Consulting Engineer
551 Fifth Ave., N. Y. C.
Specializing in Galvanizing Plants Designed and Installed
Practical Engineering Advice
Vanderbilt 3-7395

**OTTO F. JAGIELSKI**
**Consulting Engineer**
167 RADFORD ST., YONKERS, N. Y.
Specializing in manufacture of insulated wire and cable.
Modern equipments and plants designed and installed.
Development work on new machinery, methods and processes.
Practical engineering advice from rod mill to finished product.
Phone: Yonkers 3727

**Wire Drawing Diamond Dies**

**COCHAUD**
**WIRE DIE CORPORATION**
300 W. 56th ST., NEW YORK
Tel. Col. 5-1340

**Wire Straightening & Cutting Machinery**

* * *

For All Sizes, Shapes and kinds of Wire

* * *

**THE F. B. SHUSTER CO.**
**New Haven, Conn.**
Straightener Specialists Since 1866

STENOGRAPHIC COPIES
OF THE
DISCUSSIONS ON ALL PAPERS
PRESENTED AT THE
ASSOCIATION MEETINGS
ARE OBTAINABLE
AT $2.50
FROM
THE WIRE ASSOCIATION
17 East 42nd Street New York, N. Y.

**Broden Construction Co.**
*Wire Mill and Cold Rolling Equipment*
10255 Harvard Ave.
CLEVELAND, OHIO

**STRANDING MACHINERY**
For wire rope and electric cables. Armoring, taping, saturating, wire drawing, brazing, and welding equipment.
**THOMPSON-GIBB ELECTRIC WELDING CO.,**
Wire Machinery Department
Lynn, Massachusetts

# BUYERS' GUIDE

**For more complete information, consult the annual Directory, Index & Buyers' Guide.**

### ANNEALING FURNACES
See Furnaces—Various Headings

### ANNEALING POTS AND BOXES
National Wrought Iron Annealing Box Co., Washington, Pa.
Scudder, E. J., Fdry & Machine Co., Trenton, N. J.

### ARMORING EQUIPMENT
Amer. Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

### BAKERS
**Morgan Construction Co., Worcester, Mass.**
**Vaughn Machinery Co., Cuyahoga Falls, O.**

### CASTINGS—Wire Mill
E. J. Scudder Foundry & Machine Co., Trenton, N. J.

### CHROME NICKEL—Construction
National Wrought Iron Annealing Box Co., Washington, Pa.

### CLEANING & PICKLING EQUIPMENT
Broden Construction Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

### COILERS—Sheet and Wire
H. J. Ruesch Machine Co., Newark, N. J.

### CRANES—Wire Mill
**Morgan Construction Co., Worcester, Mass.**
**Vaughn Machinery Co., Cuyahoga Falls, O.**

### DIES—Composition
Diamond Die Co., of America, New York, N. Y.
Vianney Wire Die Works, New York, N. Y.

### DIES—Diamond
Balloffet Diamond Wire Dies Co., Inc., N. Y. C.
Cochaud Wire Die Co., New York.
Diamond Die Co., of America, New York, N. Y.
Driver-Harris Co., Harrison, N. J.
Vianney Wire Die Works, New York.

### DIES—Lead Extrusion
John Robertson Co., Brooklyn, N. Y.

### DIES—Repairs & Re-Cutting
Balloffet Diamond Wire Dies Co., Inc., N. Y. C.
Cochaud Wire Die Corp., New York.
Diamond Die Co., of America, New York, N. Y.
Driver-Harris Co., Harrison, N. J.
Firth-Sterling Steel Co., McKeesport, Pa.
William Haddow, Ossining, N. Y.
Vianney Wire Die Wks., N. Y.

### DIES—Recutting and Repolishing Machine
Vianney Wire Die Works, New York, N. Y.

### DIES—Rod and Tube Drawing
Carboloy Co., Inc., Newark, N. J.
Firth-Sterling Steel Co., McKeesport, Pa.
Master Wire Die Co., New York, N. Y.
Vianney Wire Die Works, New York, N. Y.

### DIES—Tantalum Carbide
Diamond Die Co., of America, New York, N. Y.
Vianney Wire Die Works, New York, N. Y.

### DIES—Tungsten Carbide
Carboloy Co., Inc., Newark, N. J.
Driver-Harris Co., Harrison, N. J.
Master Wire Die Co., New York, N. Y.
Vianney Wire Die Works, New York, N. Y.

### DRAW BENCHES—
H. J. Ruesch Machine Co., Newark, N. J.
Scudder, E. J., Fdry & Machine Co., Trenton, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.

### FURNACES—Annealing
Chas. F. Kenworthy, Inc., Waterbury, Conn.
W. S. Rockwell Co., New York, N. Y.

### FURNACES—Automatic
Chas. F. Kenworthy, Inc., Waterbury, Conn.
W. S. Rockwell Co., New York, N. Y.

### FURNACES—Bright Annealing
Chas. F. Kenworthy, Inc., Waterbury, Conn.
W. S. Rockwell Co., New York, N. Y.

### FURNACES—Electric
Chas. F. Kenworthy, Inc., Waterbury, Conn.
W. S. Rockwell Co., New York, N. Y.

### FURNACES—Lead Melting
John Robertson Co., Brooklyn, N. Y.

### FURNACES—Non-Oxidizing
Chas. F. Kenworthy, Inc., Waterbury, Conn.
W. S. Rockwell Co., New York, N. Y.

### GALVANIZING ENGINEER
W. H. Spowers, Jr., New York, N. Y.

### FURNACES—Wire
Chas. F. Kenworthy, Inc., Waterbury, Conn.
W. S. Rockwell Co., New York, N. Y.

### GALVANIZING KETTLES—
National Wrought Iron Annealing Box Co., Washington, Pa.

### INHIBITORS—
Wm. M. Parkin & Co., Pittsburgh, Pa.

### LATHES—Die Reaming
**Morgan Construction Co., Worcester, Mass.**
**Vaughn Machinery Co., Cuyahoga Falls, O.**

### LIME—Pulverized
Amer. Lime & Stone Co., Bellefonte, Pa.

### LUBRICANTS—Wire Drawing
J. T. Robertson Co., Inc., Syracuse, N. Y.
R. H. Miller Co., Homer, N. Y.

### MACHINERY—Armoring (Cable, Wire Hose)
American Insulating Mach'y Co., Phila., Pa.
**New England Butt Co., Providence, R. I.**
John Robertson Co., Brooklyn, N. Y.
**Sleeper & Hartley, Inc., Worcester, Mass.**
Watson Machine Co., Paterson, N. J.

### MACHINERY—Braiding
New England Butt. Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

### MACHINERY—Bunching
Amer. Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

### MACHINERY—Bundling
**Sleeper & Hartley, Inc., Worcester, Mass.**
**Vaughn Machinery Co., Cuyahoga Falls, O.**
Watson Machine Co., Paterson, N. J.

### MACHINERY—Cable, Electric
American Insulating Machinery Co., Philadelphia, Pa.
Fred'k M. Conran, Newark, N. J.
New England Butt Co., Providence, R. I.
Watson Machine Company, Paterson, N. J.

### MACHINERY—Chain Making
Fred'k M. Conran, Newark, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.

### MACHINERY—Closing
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

### MACHINERY—Coil Winding
Fred'k M. Conran, Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.

### MACHINERY—Coilers
Broden Const. Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
H. J. Ruesch Machine Co., Newark, N. J.
**Sleeper & Hartley, Inc., Worcester, Mass.**
Watson Machine Co., Paterson, N. J.


**Reserve your copy now of the**

## Official Stenographic Proceedings

✦ ✦ ✦

## The Wire Association Annual Meeting and Exhibit

**Buffalo, N. Y., October 3-7, 1932**

The Wire Association,
17 East 42nd Street,
New York, N. Y.

Please reserve ..... copies of the official proceedings of the Annual Meeting and Exhibit at Buffalo, N. Y., October 3-7, at $2.50 each, payable after delivery.

.....

.....

.....

# BUYERS' GUIDE, Continued

**MACHINERY—Copper Wire Drawing and Rolling**
H. J. Ruesch Machine Co., Newark, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.

**MACHINERY—Cutting**
Broden Construction Co., Cleveland, O.
F. B. Shuster Co., New Haven, Conn.
Sleeper & Hartley, Worcester, Mass.

**MACHINERY—Enameling**
American Insulating Mach'y Co., Phila., Pa.

**MACHINERY—Extruding**
John Robertson Co., Brooklyn, N. Y.
John Royle & Sons, Paterson, N. J.
Watson Machine Co., Paterson, N. J.

**MACHINERY—Flat Wire**
Broden Construction Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
H. J. Ruesch Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.

**MACHINERY—Forming**
Sleeper & Hartley, Inc., Worcester, Mass.

**MACHINERY—Galvanizing Wire**
Broden Construction Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
Morgan Construction Co., Worcester, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

**MACHINERY—Gang Winders**
H. J. Ruesch Machine Co., Newark, N. J.
Watson Machine Co., Paterson, N. J.

**MACHINERY—Insulating**
**American Insulating Machinery Co., Phila.**
**New England Butt Co., Providence, R. I.**
John Royle & Sons, Paterson, N. J.
Watson Machine Co., Paterson, N. J.

**MACHINERY—Lead Encasing Presses, etc.**
John Robertson Co., Brooklyn, N. Y.

**MACHINERY—Lead Stripping**
John Robertson Co., Brooklyn, N. Y.
Watson Machine Co., Paterson, N. J.

**MACHINERY—Lock Washer**
Sleeper & Hartley, Inc., Worcester, Mass.

**MACHINERY—Magnet Wire**
American Insulating Mach'y Co., Phila., Pa.
Sleeper & Hartley, Inc., Worcester, Mass.

**MACHINERY—Measuring Wire & Cable**
New England Butt. Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

**MACHINERY—Nail**
**Sleeper & Hartley, Inc., Worcester, Mass.**
Vaughn Machinery Co., Cuyahoga Falls, O.

**MACHINERY—Panning**
**American Insulating Machinery Co., Phila.**

**MACHINERY—Pointing**
Broden Construction Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
**Morgan Construction Co., Worcester, Mass.**
H. J. Ruesch Machine Co., Newark, N. J.
**E. J. Scudder Foundry & Machine Co., Trenton, N. J.**
Sleeper & Hartley, Inc., Worcester, Mass.
**Vaughn Machinery Co., Cuyahoga Falls, O.**

**MACHINERY—Rod**
Broden Construction Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
Morgan Const. Co., Worcester, Mass.
H. J. Ruesch Machine Co., Newark, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.

**MACHINERY—Rolling Mill**
Broden Construction Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
Morgan Construction Co., Worcester, Mass.
H. L. Reusch Machine Co., Newark, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.

**MACHINERY—Rubber Strip Covering**
John Royle & Sons, Paterson, N. J.
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

**MACHINERY—Rubber Tubing and Straining**
John Royle & Sons, Paterson, N. J.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

**MACHINERY—Screw Wire**
**Sleeper & Hartley, Inc., Worcester, Mass.**

**MACHINERY—Special**
American Insulating Mach'y Co., Phila Pa.
Broden Construction Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
H. J. Ruesch Machine Co., Newark, N. J.
E. J. Scudder Foundry and Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

**MACHINERY—Spooling**
**American Insulating Machinery Co., Phila.**
Fred'k M. Conran, Newark, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson, N. J.

**MACHINERY—Spring Making**
**Sleeper & Hartley, Inc., Worcester, Mass.**

**MACHINERY—Staple**
**Sleeper & Hartley, Inc., Worcester, Mass.**

**MACHINERY—Straightening**
Broden Construction Co., Cleveland, O.
H. J. Ruesch Machine Co., Newark, N. J.
F. B. Shuster, New Haven, Conn.
**Sleeper & Hartley, Inc., Worcester, Mass.**

**MACHINERY—Straightening Hollow Wire**
Fred'k M. Conran, Newark, N. J.

**MACHINERY—Stranding**
Fred'k M. Conran, Newark, N. J.
**New England Butt Co., Providence, R. I.**
**Sleeper & Hartley, Inc., Worcester, Mass.**
**Watson Machine Co., Paterson, N. J.**

**MACHINERY—Strip Steel**
Broden Const. Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
H. J. Ruesch Machine Co., Newark, N. J.

**MACHINERY—Swaging**
H. J. Ruesch Machine Co., Newark, N. J.
Sleeper & Hartley, Worcester, Mass.

**MACHINERY—Taping**
Amer. Insulating Mach. Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Watson Machine Company, Paterson, N. J.

**MACHINERY—Tinsel Rolling Mills**
Amer. Insulating Mach'y Co., Phila., Pa.

**MACHINERY—Trolley Wire**
Vaughn Machinery Co., Cuyahoga Falls, O.

**MACHINERY—Tube Mill**
Fred'k M. Conran, Newark, N. J.
H. J. Ruesch Machine Co., Newark, N. J.

**MACHINERY—Welding Wire**
Micro Products Co., Peoria, Ill.
F. B. Shuster Co., New Haven, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

**MACHINERY—Winding**
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
**Sleeper & Hartley, Inc., Worcester, Mass.**
Watson Machine Co., Paterson, N. J.

**MACHINERY—Wire Drawing**
**American Insulating Machinery Co., Phila.**
**Broden Const. Co., Cleveland, Ohio.**
Fred'k M. Conran, Newark, N. J.
**Morgan Construction Co., Worcester, Mass.**
H. J. Ruesch Machine Co., Newark, N. J.
**E. J. Scudder Foundry & Machine Co., Trenton, N. J.**
**Sleeper & Hartley, Inc., Worcester, Mass.**
**Vaughn Machinery Co., Cuyahoga Falls, O.**

**MACHINERY—Wire Rope**
New England Butt Co., Providence, R. I.
Watson Machine Company, Paterson, N. J.

**PACKING—Metallic Fibre**
Hudson Wire Co., Ossining, N. Y.

**MACHINERY—Wire Tinning**
American Insulating Mach'y Co., Phila., Pa.

**POTS—Lead Melting**
John Robertson Co., Brooklyn, N. Y.

**PRESSES—Lead Encasing**
John Robertson Co., Brooklyn, N. Y.

**PRESSES—Lead Extrusion**
John Robertson Co., Brooklyn, N. Y.

**PULLERS—Wire**
E. J. Scudder Fdry. & Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.

**PUMPS—Hydraulic**
John Robertson Co., Brooklyn, N. Y.

**REELS AND SPOOLS—All Kinds**
R. B. Hayward Co., Chicago, Ill.

**REEL AND TENSION STAND—**
Sleeper & Hartley Inc., Worcester, Mass.

**REEL CRUTCHES**
R. B. Hayward Co., Chicago, Ill.
Watson Machine Co., Paterson, N. J.

**ROLLING MILLS—See Machinery—Rolling Mill**

**SOAPS—Wire Drawing**
R. H. Miller Co., Homer, N. Y.
Robertson Co., J. T., Inc., Syracuse, N. Y.

**STEEL PLATE CONSTRUCTION—**
National Wrought Iron Annealing Box Co., Washington, Pa.

**TANKS—Compound**
Watson Machine Co., Paterson, N. J.

**TANKS—Steel Plate**
National Wrought Iron Annealing Box Co., Washington, Pa.

**TRUCKS**
**Morgan Construction Co., Worcester, Mass.**
**Vaughn Machinery Co., Cuyahoga Falls, O.**

**TUBE BENDERS AND FORMERS**
H. J. Ruesch Machine Co., Newark, N. J.

**VULCANIZERS**
John Royle & Sons, Paterson, N. J.
Watson Machine Co., Paterson, N. J.

**VULCANIZING PANS**
American Insulating Mach'y Co., Phila., Pa.

**WIRE—Enameled For Coils**
Winsted Insulated Wire Co., Winsted, Conn.

**WIRE—Nickel Silver and Phosphor Bronze**
Hudson Wire Co., Ossining, N. Y.
Seymour Mfg. Co., Seymour, Conn.

**WIRE—Various Kinds**
Hudson Wire Co., Ossining, N. Y.
Seymour Mfg. Co., Seymour, Conn.
Winsted Insulated Wire Co., Winsted, Conn.

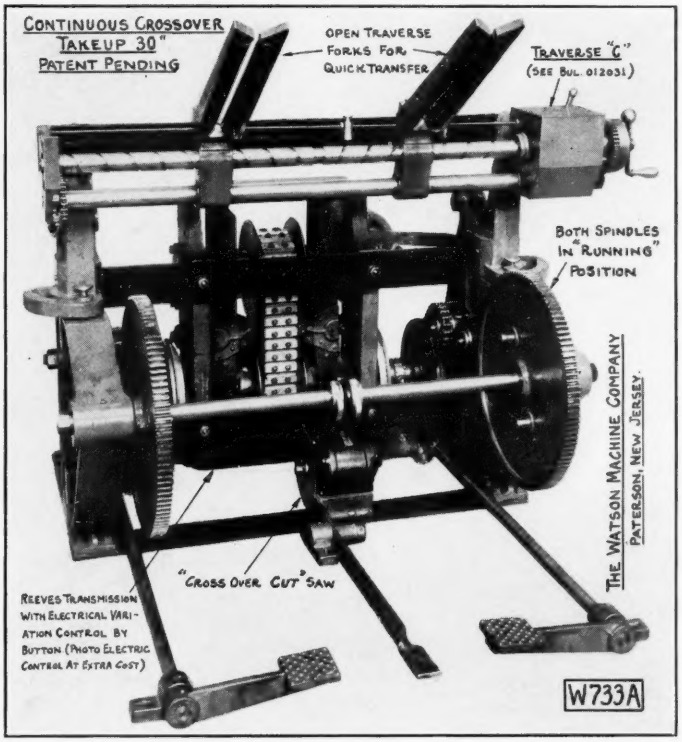
This is a carefully classified index of concerns who specialize in this industry and who advertise regularly in WIRE & WIRE PRODUCTS. Please mention WIRE when writing to these firms.

# THE WATSON MACHINE COMPANY

ESTABLISHED 1845

PATERSON, NEW JERSEY, U. S. A.

## CONTINUOUS CROSS-OVER TAKEUPS (*patent pending*)


CONTINUOUS CROSSOVER TAKEUP 30" PATENT PENDING
OPEN TRAVERSE FORKS FOR QUICK TRANSFER
TRAVERSE "C" (SEE BUL. 012031)
BOTH SPINDLES IN "RUNNING" POSITION
THE WATSON MACHINE COMPANY PATERSON, NEW JERSEY.
"CROSS OVER CUT" SAW
REEVES TRANSMISSION WITH ELECTRICAL VARIATION CONTROL BY BUTTON (PHOTO ELECTRIC CONTROL AT EXTRA COST)
W733A

Developed to permit the Reel in Take-up Stand to be removed without slowing down the machine from which wire is fed. Where tubing is on reels, this unit permits continuous operation of Tuber.

✦ ✦ ✦

As the one reel completes filling, the wire is transferred across the adjacent flanges of the two reels, both running at the same speed, and the motor cutter is brought up to saw the wire where it crosses. The full reel is then brought to a standstill, swung out to the "Loading Position", removed from the spindle, and replaced by an empty reel. This is then swung back into operating position awaiting the transfer action as the other reel completes filling.

✦ ✦ ✦

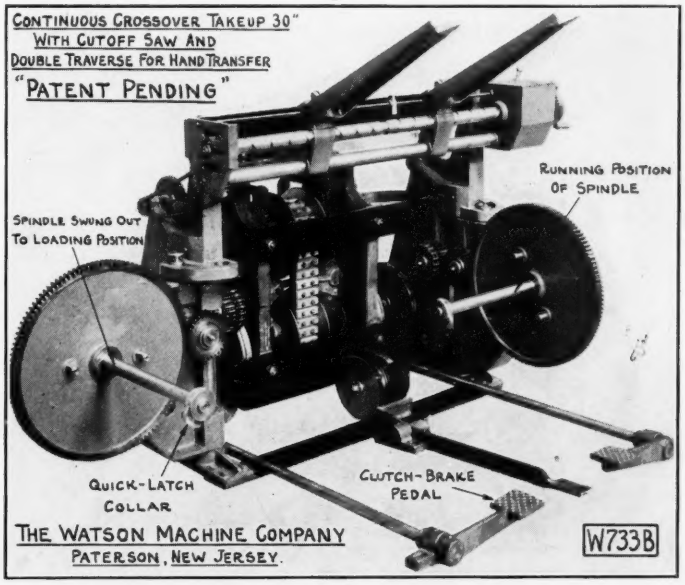
Standard construction necessitates hand transfer of running wire from guide to guide at the transfer period, but if preferred, a single guide yoke with transfer controlled by push button is provided; this being termed "SINGLE ELECTRICAL TRAVERSE"

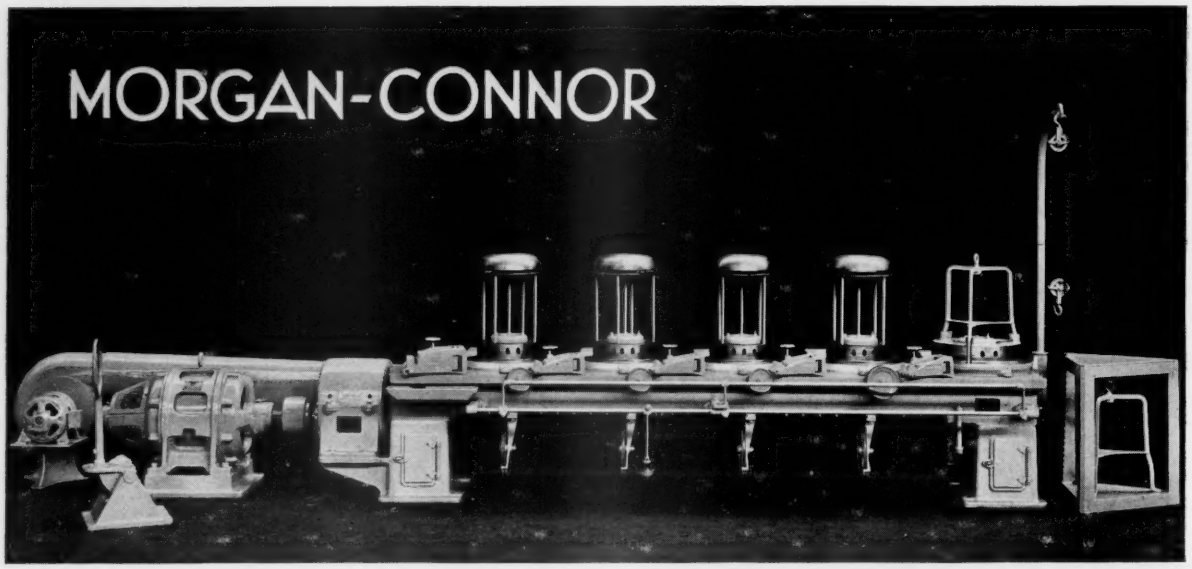
✦ ✦ ✦

The Reeves Variable Speed Transmission as provided has electric variation control by push button, to which may be added at extra cost Photo Electric Control, so that the variation is automatically taken care of.

✦ ✦ ✦

The unit shown is for 30″ diameter reels.


CONTINUOUS CROSSOVER TAKEUP 30" WITH CUTOFF SAW AND DOUBLE TRAVERSE FOR HAND TRANSFER
"PATENT PENDING"
RUNNING POSITION OF SPINDLE
SPINDLE SWUNG OUT TO LOADING POSITION
QUICK-LATCH COLLAR
CLUTCH-BRAKE PEDAL
THE WATSON MACHINE COMPANY PATERSON, NEW JERSEY.
W733B




# Morgan-Connor Handling

The largest part of the conversion cost, rods to wire, is chargeable to moving raw, process and finished material from place to place.

The Morgan-Connor Wire Machine is in itself a processing conveyor; and the layout of a group of these machines is such as to tie them in with other handling systems.

Straight-line production is made possible by the use of Morgan-Connor Wire Machines.

MORGAN CONSTRUCTION COMPANY

WORCESTER, MASSACHUSETTS

MALMEDIE & COMPANY, Dusseldorf, Germany
Sole Licensee for Morgan-Connor Wire Machines in Europe

MORGAN
WORCESTER

ENGINEERS AND MANUFACTURERS

ROLLING MILLS GAS PRODUCERS WIRE MACHINERY
COMBUSTION CONTROLS